

# COMPUTERWORLD

## Big fix will be late

Absence of stable NetWare 4.x still frustrates network administrators

By Elisabeth Horwitt

Originally slated to ship by midyear, Novell, Inc.'s NetWare 4.1 has been pulled back for another round of alpha testing, pushing back commercial delivery to the end of the summer, a company spokesman said last week.

The news incurred the wrath of NetWare systems administrators who have already suffered through the glitches and functional gaps of NetWare 4.0 and 4.01. This means they must wait several more months to get their hands on a stable, reliable, full-function version of the enterprise network service platform.

"The more the ship date slips, the more frustrated we get," said Chris Dumas, wide-area network coordinator at Commonwealth Edison



Kevin Auger, NetWare product line manager, says Version 4.1 will eventually provide stability and reliability

Co. in Chicago, a NetWare 4.01 user.

As for Novell, the delays can only prolong its continuing difficulties in getting a critical mass of corporate customers to begin the vexing migration from NetWare 3.x to 4.x.

"I'm hearing more companies are committed to NetWare 4.x vs. three months ago, but a lot are waiting for 4.1," said Frank Michnoff, a software analyst at Prudential Securities, Inc.

### Immaturity hurts

One major financial service firm, for example, has held off on implementing NetWare 4.x because the current version is not mature enough, according to Gerard Brady, a consultant at the company. The firm's testing of NetWare, page 10

## Merger of Unix groups expected

OSF would act as overseer, dropping development role

By Jean S. Bozman  
SAN FRANCISCO

With a self-imposed deadline looming two weeks away at the UniForum trade show, the Unix industry's vanguard is hammering out the details of a major restructuring of the Open Software Foundation. The overhaul will set the stage for a merger with the Common Open Software Environment alliance.

### UniForum

Under the plan, a reconstituted OSF would drop much of its software development work and cut its current staff of 300 by at least a third — predominantly from the ranks of software engineers and developers, according to sources close to the negotiations. Most product development would be farmed out to the sponsor companies, with the OSF acting as a coordinating agent to manage the various projects.

### Empowering users

The OSF's anticipated merger with COSE holds out the promise of a stronger voice for users in the open systems strategies of IBM, Hewlett-Packard Co., Digital Equipment Corp., Sun Microsystems, Inc., Novell, Inc. and others. This Merger, page 14

### Desktop standards

## Popular 486 may dampen Pentium sales

By Michael Fitzgerald

Intel Corp. will today launch an assault on the PowerPC alliance and clone makers by unveiling a new version of the Pentium chip earlier than expected. Yet the chip may be overshadowed by Intel's own DX4 processor because users say they are likely to favor this new high-end 486 over the Pentium this year and possibly into 1995.

### Stealing the limelight

Intel was expected to unveil the new version of Pentium, code-named P54C, in May, according to PC hardware makers [CW, Jan. 17]. Intel said it moved up the launch because of better-than-expected yields on the chip. But the announcement was widely viewed as an effort to grab the spotlight away from Apple Computer, Inc.'s announcement of its first PowerPC-based computers.

Intel, page 6

## Microsoft eyes enterprise ring

By Stuart J. Johnston and Ed Scannell

■ In an earnest attempt to become the IBM of the 1990s, Microsoft Corp. will this month begin presenting its distributed computing strategy for the enterprise to an already skeptical information systems community.

Microsoft will reveal its vision in pieces over the coming months, starting with the release this month of low-level components such as tools and languages.

The vision will require users to adopt a three-tiered client/server model that separates business function program code — for example, code that performs a

credit authorization — from both the client and server components.

Current client/server models allow only for a two-tiered model, which requires that either the client or server — or both — contain code defining the business processes. This makes development and maintenance Microsoft, page 12



With half the \$10 billion PC software market in its pocket, Microsoft has set its sights on the \$50 billion large-scale market.

## Apple rolls PowerPC dice

Corporate acceptance hinges on open strategy

By Mark Halper  
CUPERTINO, CALIF.

The road surrounding Apple Computer, Inc.'s headquarters is called Infinite Loop Drive, and Apple executives hope it does not describe the company's direction on the eve of its momentous launch of PowerPC-based computers.



In some benchmarks, the PowerPC chip that will drive the Power Macintosh line outperforms Intel's Pentium.

With the long-anticipated unveiling of its Power Macintosh line on March 14, Apple clearly hopes to win a greater share of the corporate market. Users and analysts lined up last week to say that Apple must do the following:

- Strike licensing deals with other PC makers for Apple's System 7 operating system, thereby making the PowerPC pervasive.
- Deliver what it has promised — desktop machines that perform three to four times faster than current Macintosh lines while maintaining compatibility with those machines.
- Encourage software vendors such as Microsoft Corp. to write Apple, page 7

### JAPAN RE-ENGINEERS

CIOs at Japan's recession-ravaged companies are looking to re-engineering to cut costs and improve efficiency. — See page 24

### Will business re-engineering catch on in Japan?

Despite formidable obstacles, re-engineering will be adopted by corporate Japan, according to three quarters of the respondents.



NUMBER OF RESPONDENTS: 53  
SOURCE: JAPAN INSTITUTE OF CHIEF INFORMATION OFFICERS RE-ENGINEERING SURVEY

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David Powers

## MANAGEMENT

■ Being the leader of the pack in the mail-order and catalog industries doesn't require cutting-edge technology—just smart use of existing technology. Ruth Owades, president of flower delivery company Calyx and Corolla, has cut short her company's distribution system so flowers are delivered the day after they are cut. That kind of direct link to customers gives companies like Calyx and Corolla a competitive edge. *Page 79*

## NEWS

■ Cisco Systems rolls out its internetworking strategy. *Page 4*

■ Microsoft aims to be the IBM of the '90s with its distributed computing strategy. *Page 1*. Then later this month, it will clarify OLE's role as the roadway to Cairo. *Page 12*

■ Sun readies new low-end SPARC workstations that will update its SPARCclassic and SPARCstation LX product lines. *Page 14*

■ Early users of IBM's mainframe-based DCE offering are enthusiastic about DCE but have reservations about its security. *Page 15*

■ Mainframe shops will have to wait a bit longer for multiple RAID storage choices, with IBM putting off mainframe RAID shipments until September. *Page 16*

## COMPUTER INDUSTRY

■ Fresh from a patent infringement suit win over Microsoft, Stac Electronics says it has set an example for other small companies seeking to protect their ideas. *Page 30*

■ MCI buys its way into the wireless communications sector. *Page 30*

## DESKTOP COMPUTING

■ Watch for laser printer prices to dive while the printers become easier to use, particularly in Windows environments. *Page 37*



## WORKGROUP COMPUTING

■ Document management tools may bring users savings and better access to data. *Page 47*

## ENTERPRISE NETWORKING

■ Users face decision time as they move off their host-based E-mail systems. *Page 53*

## LARGE SYSTEMS

■ IBM casts its plans for user-based pricing for host software. *Page 63*

## APPLICATION DEVELOPMENT

■ A GUI-based system gives the Federal Aviation

Administration a "what-if" look at air traffic. *Page 73*

## MANAGEMENT

■ How to cope with carpal tunnel syndrome. *Page 79*

## IN DEPTH

■ Billboard company Gateway Outdoor Advertising is using desktop mapping to go after new clients in areas such as media, movies, retail and fast food. *Page 87*



Gateway President  
Craig Heard

## CAREERS

■ IS professionals must stay on top of telephony jargon. *Page 93*

## MARKETPLACE

■ Laptop luggers should secure their systems, especially when carrying Apple PowerBooks or IBM ThinkPads. *Page 101*

## COMMENTARY

■ Bill Laberis says Apple has an opportunity to give IS something special if the Power Macintosh lives up to its predecessor. *Page 34*

■ Unlimited free technical support for software is the corporate world's own little version of socialism, Jeffrey Angus charges. *Page 35*

■ Microsoft needs to put out Chicago this year, even if it has to sacrifice features, according to John Gantz. *Page 35*

■ Borland is on the road back to health with a roster of new products coming out this year, David Coursey says. *Page 38*

■ Tim Lynch advises that developers keep it simple if they want to avoid the type of maintenance mess that many are just escaping. *Page 73*

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## Executive Briefing

**Mired in their nation's worst recession and political upheaval since World War II**, many Japanese executives are showing interest in re-engineering, a management theory popular in the U.S. but once rejected in Japan as radical and disruptive. *Page 24*

**Alpha trials push back the delivery date** for the next version of Novell's NetWare as early users find a frustrating number of glitches with long-awaited features. *Page 1*

**The IRS will count on an imaging system** to process tax returns about a week faster, as well as to provide refunds and conduct audits more promptly. *Page 8*

**Groupware seems to be catching on with general business executives** who are searching for ways to improve communication among their staffers. *Page 20*

**While most brokerages and other financial institutions** expect to make only minor systems adjustments to clear securities settlements within three days instead of the current five-day scheme—as mandated by an SEC ruling—most industry executives said the greatest hurdle their organizations must overcome is ensuring speedier client payments. *Page 28*

**Hughes Aircraft** will spend \$70 million on a client/server product data management system for 20,000 users. *Page 4*

**With an eye toward designing safer buildings**, a British firm uses virtual reality to see how crowds would react in simulated emergencies. *Page 82*

**Action Technologies' workflow modeler** aims to give managers a birds-eye view of their workflow application needs. *Page 49*

**New York's tax agency heads for the bank** with its outsourcing dollars. *Page 63*

**Middle management doesn't have to be a dirty word** if you have a top-notch career plan. *Page 92*

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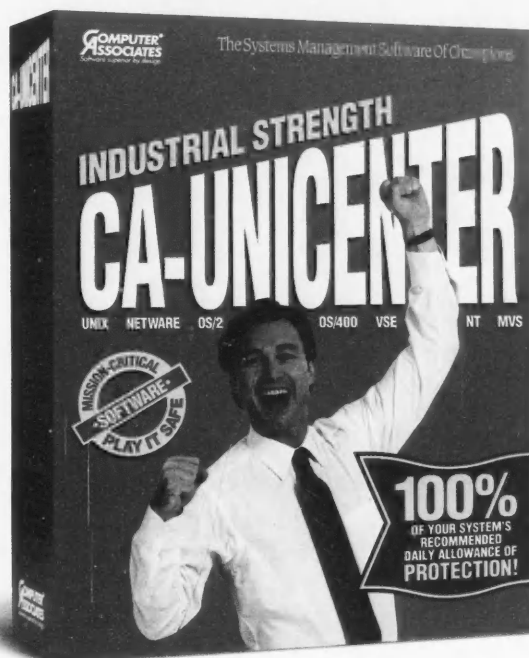
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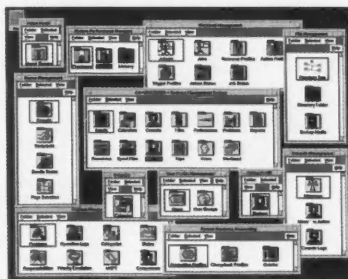


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# Global net strategies confuse users

By Stephen P. Klett Jr.

**■ Cisco Systems, Inc. last week became the latest vendor to outline a multiyear strategy aimed at providing a product to meet nearly every internetworking need. However, some users said this and similar strategies may confuse more than comfort.**

For example, while users said the trend toward one-stop shopping is appealing in terms of ensuring interoperability among various networking devices and bolstering weak areas in individual vendors' product lines, it also makes it hard to choose which path to follow because there is little difference among the strategies.

"We've definitely entered a wait-and-see mode and will not commit to anyone's strategy for at least a year, maybe two," said Sam Picture, manager of telecommunications at Home Savings of America in Irwindale, Calif.

## Partnerships abound

A virtual bevy of partnerships have cropped up in the last six months. These include 3Com Corp.'s acquisition of switching company Synernetics, Inc., Wellfleet Communications, Inc.'s partnership with hub maker Alantec and IBM's joint development announcements with Chipcom Corp., Kalpana, Inc. and Proteon, Inc.

The majority of these partnerships are aimed at filling gaps — particularly in the areas of high-speed switching and virtual networking — in each vendor's product lines.

Indeed, a core element of Cisco's strategy is a Fiber Distributed Data Interface (FDDI) switch, which is the

first product to result from its \$100 million acquisition of Crescendo Communications, Inc. last September.

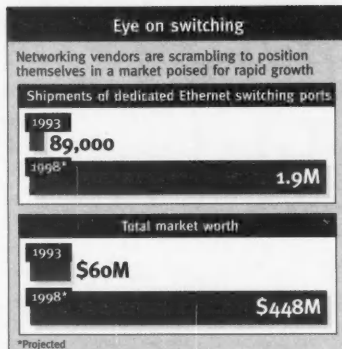
Cisco's road map combines switching and routing with an Asynchronous Transfer Mode (ATM) migration path. In addition to the FDDI switch, the company unveiled an ATM router interface, a scaled-down version of its 7000 series router and a silicon-based switch processor that doubles the packet-switching speed of the 7000 family to more than 250,000 packet/sec. An ATM switch co-developed with NEC Corp. is due this summer.

A Cisco spokesman stressed that the strategy is intended to be a gradual migration for customers over a period of five to seven years. Users can expect to see products that support it rolling out roughly every six months.

## Wait and see

User and analyst reaction to the announcement was reserved.

"Everyone is talking about the same capabilities — routing, bridging, switching and virtual LANs — which has to be confusing to users because it puts them in the difficult position of having to decide which vendor is paired with the best partner for the long term," said



Kathryn Korostoff, president of Sage Networks Research, Inc. in Natick, Mass.

"They're definitely muddying the waters," said Pat Boyd, network engineer at Duke University in Durham, N.C. Boyd said he would like to see vendors focus on their strengths (routing, in Cisco's case) and work to establish interoperability through standards rather than the complete sell.

## Support structure

The confusion factor aside, observers said Cisco's strategy is strong because it of-

fers a migration path to future ATM technologies while offering FDDI as an interim solution. More important, it has products in place to support it. In addition, they said by offering switching, Cisco may help clear up the fuzzy line between hub and router [CW, Feb. 14].

"They want to use the router as it was originally intended — as a firewall between workgroups and a gateway between WANs," said Charlie Robbins, an analyst at Aberdeen Group in Boston.

"They've realized routing doesn't have the right price/performance mix in certain environments where switching does," he added.

**Wellfleet** hones SNMP features in its routers. See page 54.

## Hughes plans major overhaul

By Lynda Radosevich

Within five years, Hughes Aircraft Co. plans to roll out a completely new process for producing every product that the multibillion-dollar company makes.

Already two years into a massive business process re-engineering project, the El Segundo, Calif.-based defense contractor will announce this week a corresponding information technology piece: a \$70 million software "envelope" that integrates engineering and manufacturing product data and organizes workflow in a client/server setup.

Hughes' strategy is to make product data available to "everyone on the team, any place in the corporation, and to include our suppliers and customers," said James B. Woods, corporate staff vice president and chief information officer.

The system rollout will start with 50 internal sites, with more than 20,000 users linked by an Asynchronous Transfer Mode (ATM) network. There could be 40,000 users by 1999, he said.

The integrated Product Data Management (PDM) system, purchased from Sherpa Corp. in San Jose, Calif., should help shorten product development times by 50% and reduce costs enough to pay for itself within two years.

Sixty percent of the payback will come from reduced labor costs as the company consolidates and automates functions. Downsizing and consolidating products will account for a 40% technology savings.



Hughes Aircraft Co.'s  
James B. Woods

The PDM software will provide the newly integrated design, manufacturing and support teams with instant access to all data associated with a particular product and its parts.

For instance, a support person in the field will be able to access the system, type in a parts number and see a tree-structured picture of the computer-aided design drawing, the quality assurance documentation, the manufacturing specifications, the supplier names and other information.

The system accomplishes this by linking data in the computer-aided design systems used in design and the manufacturing resource planning systems used on the shop floors. It also substitutes paper-based administrative processes with electronic documents and automated workflow. Woods said the system includes security software that restricts user access to data such as design specifications.

The Sherpa technology is based on an Oracle Corp. relational database and proprietary object model technology. It will reside on Digital Equipment Corp. and Sun Microsystems, Inc. Unix servers, which will operate mainly on TCP/IP or Open Systems Interconnect protocol stacks. End users have mainly Windows and Macintosh desktops with some Unix boxes. They will be linked first by an ATM backbone and Ethernet, and over the next several years, by ATM directly to the desktop.

Also, the system will link to the company's IBM ES/9000 mainframes.

## Johnson named news editor

Alper takes over CW's *Client/Server Journal*

*Computerworld* has named Maryfran Johnson to the position of news editor and Alan Alper to the position of editor of *Computerworld Client/Server Journal*.

"Maryfran brings her unique blend of high energy, intelligence and reader-driven focus to our news operation," said *Computerworld* Editor in Chief Bill Laberis. "And Alan will take some 30 months of front-line experience as news editor to *Client/Server Journal*, which will benefit greatly from his sense of industry trends and knowledge of information systems."

Johnson, 40, helped launch *Client/Server Journal* last summer and served as editor of the magazine through its most recent issue. A veteran of daily newspapers, she joined *Computerworld* in 1989 as a senior writer covering midrange computing. She was promoted to senior editor in 1990 and covered workstations and open systems computing for three years before moving to *Client/Server Journal* last year.

She holds a bachelor's degree in journalism from the University of Florida and a master's degree in journalism from Ohio State University.

Alper, 36, joined *Computerworld* as news editor in 1991. His management of the news staff contributed to *Computerworld*'s winning the Best Computer Newspaper award from the Computer Press Association in 1992. He also managed the department through a major redesign of *Computerworld* in 1992 and a conversion to a client/server production computer system.

Previously, Alper was executive editor at *Computer Systems News* and a mid-Atlantic correspondent at *Computerworld*.



Maryfran Johnson



Alan Alper

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PC Magazine

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Ingres Server "...we would not recommend it because of the showstopping multi-user bug we encountered."

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# ORACLE®



# HP hubs expected to fill middle gap

By Stephen P. Klett Jr.

Hewlett-Packard Co. will today unveil a next-generation networking architecture based on a family of stackable hubs. The AdvanceStack hubs feature a level of intelligence that analysts said is the first to fill the gap between low-end hubs and chassis-based "superhubs" while offering users an upgrade path to high-speed networking.

Positioned as a successor to its EtherTwist product line, the AdvanceStack family was designed to provide users with a foundation technology to which more complex functions can be added.

For example, the hubs have an expansion slot that allows upgrades to Simple Network Management Protocol (SNMP) management, security, bridging and routing, remote monitoring and high-speed connections to 100VG-AnyLAN, HP's 100M bit/sec. networking topology; Fiber Distributed Data Interface; and, eventually, Asynchronous Transfer Mode. Router and 100VG-AnyLAN modules are slated to ship at year's end.

While many of these features are available from other vendors such as 3Com Corp., analysts said HP was the first in the stackable market to offer them under one umbrella.

"Until now, stackable hubs have been perceived as a low-end commodity — nearly everyone had them but did not of-

fer the ability to add intelligence and new technology as needed," said Charlie Robbins, an analyst at Aberdeen Group in Boston. "HP is on the right track here with its building-block approach."

## Users impressed

The hub's low entry price, flexibility and upgradability scored a hit with the five users *Computerworld* interviewed last week. "Having a single vendor for interconnectivity at the hub level is important because it allows us to start small, which our budget demands," said one beta user at an East Coast research laboratory,

who asked not to be named. "I also like the idea of a vendor providing a gradual migration path instead of feeding us everything at once."

Slated to ship in April, the hubs will be available in 12-, 24- and 48-port configurations, with an entry price of \$1,079. Up to 16 48-port hubs can be stacked for a total of 784 ports.

Three levels of management are offered, starting with a built-in Windows-based management application called HP Stack Manager that lets managers configure, monitor and troubleshoot a stack of hubs as if it were one device. SNMP management and network traffic analysis and workgroup security features are available as options.



## Intel

CONTINUED FROM PAGE 1

erPC-based systems (see story at right). Intel's move to push Pentium as the standard microprocessor in 1995 is also an attack on Advanced Micro Devices, Inc. and Cyrix Corp., which are struggling to get their 486 clones produced in volume. If Intel succeeds in pushing the market to Pentium, it could seriously damage both these companies, observers said.

While several users said they would move to Pentium if pricing fell to the \$2,000 range, this will probably not happen before the fourth quarter because of supply and pricing issues. Most PC managers contacted indicated limited interest in Pentium, at least until 1995.

"We don't see too much of a business need for anything bigger than a 486," said Justin Alexander, manager of advanced technology at Smith-Kline Beecham Corp. in Philadelphia. Alexander said the company will probably not shift to Pentium-based systems until they are as cheap as 486s.

Intel is promising that Pentium-based PCs will be priced at \$2,000 by year's end — \$500 less than it predicted two months ago [CW, Jan. 10].

For desktop sales, "\$2,000 is the magic price point," said Paul S. Otellini, Intel's senior vice president and general manager of the microprocessor group. He said Intel had been too conservative earlier in the year, and it now expects to see the market shift from the 486 to Pentium before mid-1995.

But even when Pentium prices fall, several users said they will compare Pentium to RISC processors before deciding.

"The DX4 — that's fine; it's a faster PC, but I don't see us changing to Pentium for at least 10 to 11 months," said Tom Balzarini, PC coordinator at Associated Grocers, Inc. in Seattle. He said RISC machines may bump Pentium systems from his shop's buy list depending on other factors, such as the performance of Microsoft Corp.'s Windows NT.

"Intel is not the only chip player

not come until April at the earliest and possibly not until July. Intel itself said its 66/100-MHz Pentium will not be available in volume until the fourth quarter.

Bridgeport Hydraulic Co., a private-sector water utility in Bridgeport, Conn., has no major Pentium purchase plans now and will likely continue adding 486-based systems as long as the price gap between the two remains more than \$400 or \$500, said Dave Yakerson, network administrator.

"Why go out and buy a Cadillac when a Chevy will do for you?" he said.

Analysts said the DX4 would be a clear-cut winner. "The DX4 is a real life-extender for the 486 desktop and a very significant boost to notebook performance," said Richard Zwetckhenbaum, an analyst at International Data Corp. in Framingham, Mass. He said the DX4 should preclude Pentium's becoming the best-selling microprocessor in 1995.

Of course, there are users who will head right for the Pentium aisle. Jim Hansel, vice president for investment systems at UBS Asset Management (NY), Inc. in New York, noted, "We have already switched to the Pentium as our standard for new purchases, and we would probably switch to the higher-speed Pentiums within weeks, or as soon as they become reasonably available."

National correspondent Mitch Betts and senior editor Craig Stedman contributed to this story.

PC vendors target the server market with the niche tactics that worked on the desktop. See page 47.

## Apple details software gospel

After saying last summer that it would license its operating system to other computer makers, Apple Computer, Inc. must follow through if the PowerPC is to grab hold of the corporate market, according to Pieter Hartsook, editor of the "The Hartsook Letter," an Alameda, Calif.-based market research publication.

Hartsook predicted Apple will sign its first licensing agreement by June and that third-party shipments of Apple platforms could hit the market by the third or fourth quarter.

To help spread its gospel, Apple last week outlined its systems software road map. Senior Vice President David Nagel said all future operating system development will be based on the PowerPC machines. Planned enhancements to the System 7 operating system include the following:

- System 7.5, due this summer, which includes a "how to" operations guide, embedded TCP/IP support, a scriptable Finder, Drag Manager, Quickdraw GX, QuickTime, PowerTalk and the client piece of Apple's Open Collaboration Environment technology.
- System 8, due in 1995 with a sophisticated on-line help system, improved memory protection and native support of IPX, TCP/IP and AppleTalk protocols.
- A multithreaded, multitasking operating system, code-named Gershwin, that is slated for 1996 and will use a microkernel design. It will require rewritten applications. Features will include memory protection and OpenDoc 2.0.

—Mark Halper and Kim S. Nash

Pricing salvos			
While Intel's new DX4 and P54C products are expected to drop dramatically in price this year, they have a long way to go to match the PowerPC			
INTEL DX2 PROCESSOR*	Q2 1994	AVAILABLE IN SYSTEMS	
66 MHz	\$360	Now	
INTEL DX4 PROCESSOR*			
75 MHz	\$475	Now	
100 MHz	\$580	Now	
PENTIUM PROCESSOR*			
60 MHz	\$675	Now	
66 MHz	\$750	Now	
90 MHz	\$849	Limited availability	
100 MHz	\$995	Limited availability	
POWERPC 601**			
50 MHz	\$238	Now	
66 MHz	\$318	Now	
80 MHz	\$425	Now	

PER-UNIT PRICING IN LOTS OF: \*1,000 UNITS, \*\*20,000 UNITS

any more. Pentium will be one of many faster chips for 1995," said Chris Cane, PC coordinator at the Institute for Advanced Study, a think tank in Princeton, N.J.

Another factor influencing user decisions is that P54C systems may be slow to come to market because Intel caught many hardware makers off guard when it accelerated the Pentium release.

While several vendors said they would begin shipping systems based on the new 60/90-MHz Pentium almost immediately, they conceded that volume shipments will

## Intel takes Pentium RISC

### Aims performance at server market

Intel Corp. will take a run straight at the heart of the RISC server market with its new Pentium chips.

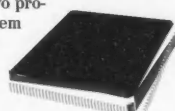
Intel's new 60/90-MHz and 66/100-MHz Pentium chips have built-in circuits that allow two processors to share the same system cache in conjunction with a new Peripheral Component Interconnect chip set that supports multiprocessing configurations.

Intel claims its new 60/90-MHz Pentium and 66/100-MHz chips in tandem will outperform current workstation servers.

However, analysts suggested Intel's multiprocessing strategy may in fact bring gliee to RISC vendors.

"Is multiprocessing really the direction you want to put the industry in when that's your Achilles' heel?" asked Dean McCarron, an analyst at Mercury Research in Scottsdale, Ariz.

—Michael Fitzgerald



## Apple PowerPC

CONTINUED FROM PAGE 1

applications that run natively on the PowerPC because software for the 68000-based machines will not take full advantage of the PowerPC's speed.

PowerPC-based machines "are incredibly fast. There's a lot of promise there," said Brian Connes, manager of the information center at DHL Airways, Inc. in Redwood City, Calif. "Compatibility is the big issue. Every time something new comes out, that's always a challenge."

Connes, whose shop includes a mix of Macintoshes and Unix, DOS and Windows machines, said he plans "to buy a few initially just so we can get our hands on them." However, he said he will hold off on a larger purchase until more software is available that runs natively on the PowerPC.

Like other users, Connes noted that early on, only limited software — mostly graphics-oriented packages — will be available specifically for the PowerPC. Apple has said Macintosh software will run on the new machines but in a slower, emulated mode.

For Apple to deliver on its speed promises, users said smooth relations with Microsoft are critical because Microsoft will develop PowerPC versions of some of its popular software packages.

"What is Apple going to do to optimize Excel on the PowerPC?" asked Arthur Tisi, chief systems officer at the Metropolitan Museum of Art in New York. While enthusiastic about the promise of the PowerPC, Tisi said he has imposed a moratorium on Apple purchases until evidence of the machine's performance in live environments is available.

Joe Harris, director of information technology at NBC's television stations division, said he, too, wants to see more

proof that the PowerPC lives up to its advance billing.

"I haven't seen anything other than a demo," he noted, adding that one of his chief concerns is that new machines maintain compatibility with other Macintosh computers and that they "integrate into everything else we have."

Harvard University's fund-raising division sees the PowerPC in its future but will hold off on buying it. "How many applications are going to be native?" asked

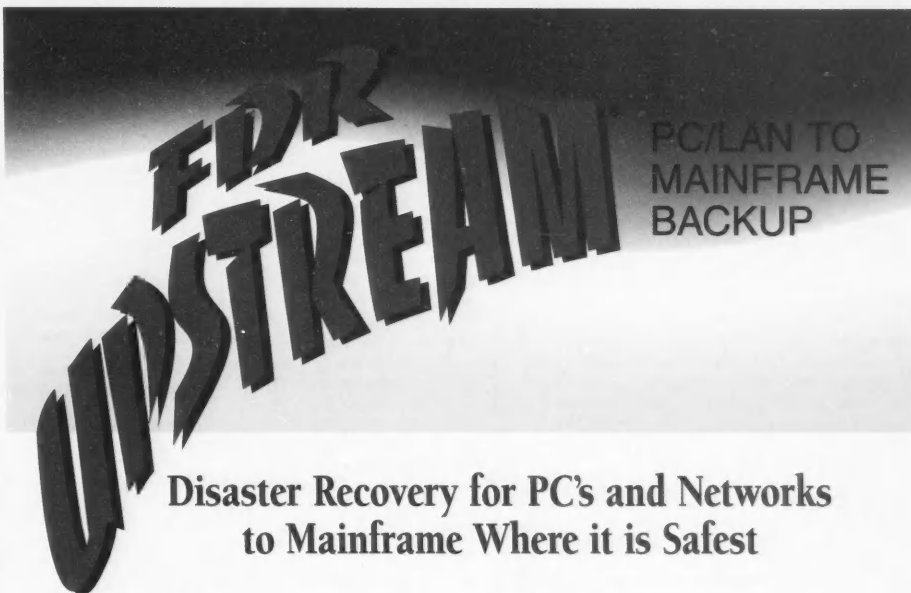
James Conway, director of development computing services.

For Conway, the lure of the PowerPC is the speed it will bring to his ambitious plans to establish multimedia video and teleconferencing links among Harvard offices worldwide. He said he hopes to have a working model by this summer to test tie-ins between Harvard offices in Cambridge, Mass., and Los Angeles.

Users will not be disappointed in the PowerPC's speed, observed Pieter Hart-

sook, editor of "The Hartsook Letter" in Alameda, Calif. He noted that because the PowerPC chip — co-designed by Apple, IBM and Motorola, Inc. — is in its first generation, it has plenty of growing room vs. the maxed-out 68000 line.

"It won't take much to boost the performance of the PowerPC because it's at the beginning of its life cycle," Hartsook said. "By comparison, it will take a lot to boost Intel chips because they're at the end of their life cycle."



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## Improved Newton

While the introduction last week of a new version of Apple's Newton personal digital assistant drew positive reactions from users and analysts, everyone is still awaiting software applications.

Compared with the original Newton, the Newton MessagePad 110 includes three times the amount of memory, plus longer battery life.

Apple is offering the new machine for \$599, and it dropped the price of the original Newton, the MessagePad 100, from \$699 to \$499.

Handwriting-recognition improvements include letter-by-letter recognition, a feature that enables the Newton to process words not in its dictionary. A deferred recognition feature allows users to write words without waiting for immediate translation by the machine. — Mark Halper

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## News Shorts

**Microsoft readies major reorganization**

Microsoft Corp. will finalize plans for a major internal reorganization in the next few weeks, sources close to the company said last week. The move will refocus company groups around "missions rather than products," one source said. For example, a new enterprise computing organization will consolidate groups responsible for the Windows NT and Cairo operating systems and the company's various server products, along with some members of the Solutions Marketing group and possibly some or all of Microsoft Consulting. While the reorganization may eliminate some jobs, its primary purpose is not to cut head count or maximize short-term profits, the source said.

**No more tricky software**

New York Mayor Rudolph W. Giuliani's administration last week backed down from its attempt to block the city's Board of Education from spending money on supplies. The mayor's office had installed software on the accounting system used at the Board of Education to make it seem as though there were no funds available. The board threatened legal action, and the mayor's office reversed itself.

**Sharp and IBM PC Co. do flat-panel deal**

Sharp Corp. and the IBM PC Co. have signed a deal for Sharp to supply thin film transistor, active-matrix, color, flat-panel displays to the PC Co., according to sources near the companies. The deal should help reduce the PC Co.'s backlogs on its high-end notebooks. Neither company would comment.

**Novell licenses database software**

Novell, Inc. has licensed NetFrame Systems, Inc.'s Lock Manager software for use in its multiprocessing NetWare technology. Lock Manager allows multiple processors to work together on a single application such as a database. It coordinates access to data, shuttles requests in a controlled fashion and verifies that no more than one processor tries to update data at the same time.

**John White joins Compaq as CIO**

Compaq Computer Co. has created a chief information officer position and has filled it with a Texas Instruments, Inc. veteran: John W. White, president of TI's Information Technology Group and a former CIO at TI. White will report to Compaq Chief Executive Officer Eckhard Pfeiffer and oversee Compaq's information systems operations worldwide. White is the second IS executive to leave TI recently: Ralph Szygenda joined Bell Atlantic Corp. half a year ago.

**SHORT TAKES** Local exchange carrier Bermuda Telephone Co. said it has begun offering electronic-mail and electronic data interchange services to business customers. The company said it is using SoftSwitch, Inc.'s Enterprise Mail Exchange to provide the messaging switching services. ... **Lotus Development Corp.** has agreed to sell Realtime, a spreadsheet with live market data feeds used in the financial industry, to Market Arts Software, Inc. in New York. Lotus said it sold the vertical application, for undisclosed terms, to hone its focus on the desktop and workgroup markets. ... **AT&T** unveiled a developer's kit for Cellular Digital Packet Data last week. ... **GTE Mobilenet** will make its first test of Code Division Multiple Access digital cellular switching in Austin, Texas, part of a six-month trial set to commence in November. It will involve about 1,000 users.

More news shorts, page 16

# IRS goes digital to speed returns

By Mitch Betts  
WASHINGTON

In an effort to eliminate a lot of paper-pushing down the road, the Internal Revenue Service last week awarded a \$1.3 billion contract to IBM Federal Systems Co. for the digital image processing of all tax forms filed by U.S. taxpayers in the late 1990s.

The imaging system, which will affect virtually every American, was designed to help the IRS process tax returns about a week faster, as well as provide refunds and conduct audits more promptly. Even the look of common tax forms such as the 1040 will change to accommodate handwriting-recognition technology.

The IRS said it expects to be on-line with the system in time for the 1996 tax season.

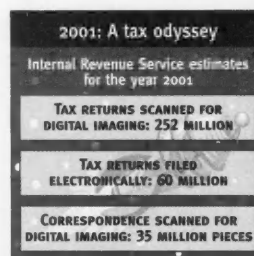
In the next few months, the IRS will officially transfer the 15-year systems integration contract to Loral Corp., whose purchase of IBM Federal Systems for \$1.52 billion was completed one day after the IRS contract was announced [CW, Dec. 20, 1993].

**System plans**

The plan is to install the Document Processing System in the IRS processing center in Austin, Texas, starting in August 1995. By 1998, the system is slated for installation at four other processing centers: Ogden, Utah; Cincinnati; Memphis; and Kansas City, Mo.

The system will scan incoming tax forms to capture digital images. Next, special software will strip out the IRS form and instructions to create a streamlined image of just the taxpayer data. Optical character recognition (OCR) technology will then convert the handwritten numbers into computer data for further processing.

The imaging system is a key part of the agency's overall Tax Systems Modernization project, which calls for a mix of electronic filing and electronic imaging to capture data from paper filings.



Critics said the boom in electronic filing of tax returns will diminish the cost-effectiveness of the imaging system because the IRS will get less paper. In response, program manager Coleta Brueck said the IRS figures it will still get 252 million paper filings in the year 2001 but can adjust the size of the imaging system during the phased rollout if that number changes.

Congressional investigators, meanwhile, worried that the Document Processing System would duplicate the work of another IRS imaging system, called the Service Center Recognition/Image Processing System (SCRIPS). However, Brueck said the two systems have somewhat different roles and eventually will be "blended" together.

SCRIPS, an \$88 million contract won by Grumman Corp.'s Data Systems unit last year, was viewed as an interim step until the Document Processing System becomes operational, but procurement delays for SCRIPS have the two bumping into each other.

Brueck said SCRIPS handles data capture for four IRS forms that are single-sided and easily read by OCR equipment. The more ambitious Document Processing System will handle all complex forms and correspondence.

Coincidentally, the losing bidder for the Document Processing System was Grumman Data Systems, which was told in November

that it failed a key technical test. Since then, IBM has been the apparent winner while the IRS tried to negotiate an affordable price, said Bob Dornan, senior vice president at Federal Sources, Inc., a McLean, Va.-based federal market research firm.

"Presumably Loral bought IBM Federal Systems knowing that this big contract was in their pocket," Dornan said. As for IBM, "It's really a shame they needed money so badly that they would sell off one of their crown jewels just as it is hitting its stride," he added.

**New York state tax agency** turns to bank for outsourcing. See page 63.

# FAA overhaul costs soar

By Gary H. Anthes  
WASHINGTON

The Federal Aviation Administration's troubled effort to overhaul the nation's air traffic control system took another nasty turn last week: A just-completed internal study revealed the project is likely to cost \$1 billion more than what was estimated three months ago.

That is on top of a \$1.2 billion overrun announced in November — bringing the Advanced Automation System's (AAS) total estimated cost to \$6.9 billion [CW, Dec. 20, 1993]. The mammoth project, which is now at the \$2.3 billion watermark, is two years behind schedule and could slip another 20 months, FAA administrator David R. Hinson said at a press conference.

As a result, Hinson announced he is replacing top FAA managers on the project, although he refused

to say how many. He is also suspending work on a major but risky piece of the system and demanding performance guarantees from contractors.

In December, the FAA said cost overruns had thus far stemmed primarily from contractors' underestimates of the project's complexity and new and expensive requirements added by the FAA — for example, the need for "continuous operations" in which the system remains available to controllers while new data is loaded.

An aide on Capitol Hill who has been involved in FAA oversight said the latest FAA actions demonstrate a vigor and willingness to acknowledge shortcomings not previously seen.

"They did a terrific job of opening up the can of worms," said the aide, who did not want to be identified. "These are new people who are not just defending turf. I'm op-

timistic this whole thing will be successful."

The suspended piece of the project — which Hinson said may ultimately be canceled — is the Area Control Computer Complex, estimated in November to cost \$646 million and now pegged at a little more than \$1 billion. It is intended to combine in one system the two host computer systems used to control aircraft near airports and en route between airports.

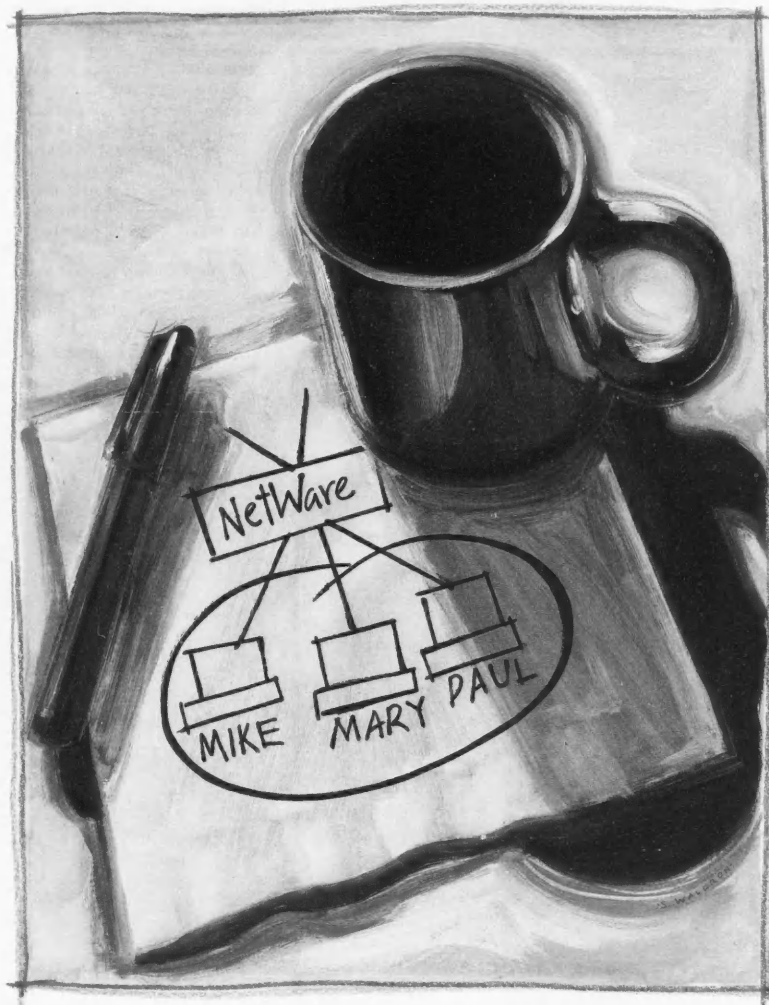
Two other subsystems — the heart of the AAS — will give controllers new workstations. These are now expected to cost \$1.55 billion, or 22% more than was forecast in November.

Hinson said he will soon have the results of two additional studies — an internal assessment of technical requirements and an external review by the Center for Naval Analysis — and will make mid-course corrections as needed.

**FAA tests** traffic-routing system. See page 73.



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■ **NOVELL.** The Past, Present, and Future of Network Computing.

## NetWare

CONTINUED FROM PAGE 1

Ware 4.01 on a pilot network of several servers "was not successful," he said.

Andy Palms, manager of campus computing sites at the University of Michigan at Ann Arbor, spoke for many users when he said that NetWare 4.01 needs to be "more resilient, tougher and [have] more

utilities to work with the [directory] tree."

Kevin Auger, product line manager for NetWare operating systems at Novell, said NetWare 4.1 will indeed provide more stability and reliability, as well as "enhanced everything: file, print, backup and licensing services."

One crucial reliability feature missing from NetWare 4.01 is support for SFT III, Novell's disk mirroring software that provides fault tolerance for NetWare

servers. While SFT III runs on NetWare 3.x servers, "there is no version of NetWare out there that has the stability, fault tolerance and global directory services" necessary to support large corporate networks, Brady said.

### No recent update

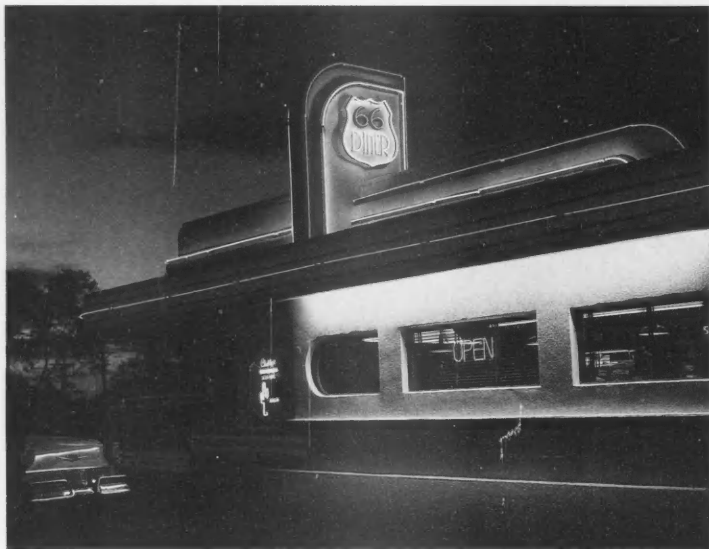
To make matters more frustrating for users, Novell has not updated SFT III since NetWare 3.11, Brady said. As a result, the fault-tolerant software does not support

### Just what the user ordered

Novell's latest time frames for delivery of key NetWare 4.x features:

Spring
NDS prune and merge
NDS support for NetWare 3.x
Late summer, with NetWare 4.1
SFT III support
NDS support for the Macintosh

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features introduced for NetWare 3.12 and beyond, such as read-ahead cache.

"So there is a very big gap, and very old code, on the current SFT III," Brady said.

Another promised NetWare 4.1 feature that many corporate users are impatiently awaiting is NetWare Directory Services (NDS) support for the Macintosh. This is a crucial capability for the University of Michigan, which has about 10,000 Macintoshes, Palms said.

Novell expects to get the new NetWare 4.1 alpha version out this month, and that version should graduate to beta testing shortly after that, Auger said. The original alpha was delivered with

components, such as the installation process, in a rough or unfinished state, primarily to get customer feedback earlier, Auger added.

Problems with the initial alpha caused Novell to revise its original time frame for shipping 4.1 from early to late summer, he explained.

**NetWare 4.01  
needs to be  
"more resilient,  
tougher and  
[have] more  
utilities to work  
with the  
[directory] tree."**

— Andy Palms,  
University  
of Michigan

### A question of when

On a more hopeful note, Novell plans to ship NDS directory pruning and merging tools — as well as NDS support for NetWare 3.x binderies — in the spring as a separate release from NetWare 4.1, according to Auger. Both are at the top of many corporate users' NetWare wish lists.

However, two users said Novell told them recently that the NetWare 3.x directory synchronization and NDS pruning tools were definitely slated to ship with NetWare 4.1 in late summer.

Not all users are waiting for NetWare 4.1 to begin their migration. Companies such as Blue Cross/Blue Shield of Illinois, for example, report doing quite well, thank you, with NetWare 4.01.

"Some things, such as pruning and grafting new branches onto the directory tree, we have to do in a convoluted way, but it is working," said Frank Sokol, a manager of product acquisitions at the Chicago insurer. "NetWare 4.1 would be nice, but it is not necessary."

Indeed, the delay is unlikely to deter users from implementing NetWare 4.x in the long run, Michnoff said, as long as 4.1 provides "the stability they are counting on."

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## MICRO FOCUS®



# Microsoft to clarify OLE road to Cairo

By Melinda-Carol Ballou

Microsoft Corp. will go all out to explain its distributed object strategy next week at Software Development 94.

The company intends to clarify the migration path for developers who want to move to Cairo, its upcoming object-oriented operating system, using distributed Object Linking and Embedding (OLE). It will also announce new capabilities for Microsoft tools to facilitate the process, according to Microsoft sources.

But some industry analysts and users have questioned Microsoft's ability to make that transition using OLE technology, which was originally designed to target single desktops.

"Taking that same model and applying it across the network requires a very different approach," said Judith Hurwitz, president of Hurwitz Consulting, a Watertown, Mass., consulting firm. Issues that will concern developers include the transport mechanism that enables objects to communicate with one another, security and data integrity, Hurwitz said.

Microsoft officials responded by saying that they will address these concerns using Component Object Model (COM), the object model for OLE.

This is not to be confused with Common Object Model, also dubbed COM, which is a specification for integrating OLE with Digital Equipment Corp.'s Object Broker — currently under development by Digital and Microsoft and ex-

pected in early release form this month.

According to Andy Held, product manager for OLE, Component Object Model handles object distribution by routing OLE messages to OLE objects elsewhere on the network. Component Object Model will use Microsoft's version of the Open Software Foundation's Distributed Computing Environment remote procedure call as the transport mechanism for those messages.

"You run your OLE 2.0 application on the new implementation of COM which supports distributed objects. COM offers the distributed service," he said.

## Benefits

Some early users of the technology reacted positively.

"The ultimate benefits are tremendous," said Alex Kalpaxis, vice president at Bankers Trust Co., a New York-based investment house. With Common Object Model, the bank expects to be able to "build a base class of distributed objects from which we will be able to create new financial entities as the dynamics of the marketplace change," he added.

But other developers questioned how easy it would be to get the technologies to work together and to distribute OLE across heterogeneous systems.

**Windows NT shows gains against Unix in the health care sector.** See page 50.

# Touchdown messaging line gets a closer look

By Lynda Radosevich

Microsoft Corp. last week previewed for reporters and analysts the next iteration of the Microsoft Mail client software, formerly code-named Capone [CW, Sept. 9, 1993]. The vendor also provided some new details about updates to its messaging servers, which it plans to ship in the third quarter.

The company also renamed all components of its upcoming messaging line "Touchdown." Actual product names have not been picked, a spokeswoman said.

## Features

The new messaging client is meant to serve as a "universal in-box" and will provide a single front end for the forthcoming file-sharing Microsoft Mail electronic-mail server and the client/server Enterprise Messaging Server (EMS) from Microsoft. The client will interface to workgroup documents and on-line services, said Paul Maritz, senior vice president of Microsoft's systems division.

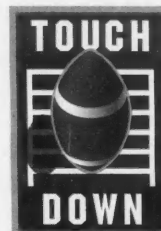
The workgroup documents are publicly accessible folders or bulletin boards. These can be exchanged between servers using either the message transport or database replication services, according to Tom Evslin, general manager of workgroup strategy marketing at Microsoft. Lotus Development Corp.'s Notes, the red cape to Microsoft's workgroup bull, also uses replicated database technology.

The on-line services are under development. Microsoft declined to comment.

## Bundling

Microsoft will bundle a Windows version of the client software in Windows 4.0 but first will likely offer Windows, Macintosh,

DOS and Unix clients bundled with the server software. The client will access the back-end services, via various Microsoft Messaging Application Programming Interfaces, Object Linking and Embedding, Open Database Connectivity and the X.400 Application Programming Interface Association's Common Mail Calls.



## Microsoft

CONTINUED FROM PAGE 1

more difficult to support.

With the three-tiered model, "you can rev the user interface and not have to touch those business rules. But right now, it's hard to separate those out," said Jesse Berst, editorial director at the "Windows Watcher" industry newsletter in Redmond, Wash.

But Microsoft faces some rather large obstacles to selling a grand architecture. For one thing, many of the pieces are not available yet. Microsoft must also win support from an IS customer base that has been burned in the past by failed grand schemes such as IBM's Systems Application Architecture (SAA).

Microsoft takes its first steps this month by introducing enhancements to Visual Basic controls that add support for Object Linking and Embedding (OLE) Version 2.0 and multiple languages.

These OLE controls, called OLCs, will let corporate and third-party developers write small, modular programs that can

be pasted into other programs or used alone [CW, Jan. 24].

Microsoft also plans to build support for the new client/server model into Cairo, the next major release of the Windows NT operating system.

Although not expected to appear until 1995, Cairo will feature an object-oriented file system that keeps track of data and program code as objects rather than as files. It will also feature a distributed version of OLE — known as the Common Object Model — that can function effectively across an enterprise (see story above).

Another major component of the Microsoft model is a repository, called the Application Structure Database, that will keep track of OLE and other objects, said David Vaskevitch, Microsoft's director of enterprise computing. He gave no other details.

Before this happens, Microsoft must deliver many of the low-level pieces, including OLCs, languages that take advantage of them and Cairo. It also must win acceptance for its three-tier client/server model.

And finally, it must deliver on the entire grandiose plan for a repository with an open architecture that allows other

tools to work with it.

While end users generally hailed Microsoft's intentions, getting users to understand — much less adopt — the company's ideas is likely to be as daunting a task as it was for IBM to advance its own complex architecture, SAA.

Many IS professionals who suffered through IBM's attempts to establish its Repository Manager and AD/Cycle strategies said they are more than a little skeptical about Microsoft's ability to implement its vision across a corporate enterprise.

"Microsoft may be coming up with a solution for problems that do not exist," said Bob Holmes, manager of systems evaluation at Southern California Gas Co.

## Difference of opinion

"Microsoft is not taking the same all-or-nothing path that IBM did. The point is, it's a scaled-back or staged implementation," said Bill Cornfield, president of the Windows Support Group consultancy in New York.

It is expected that an ensuing give-and-take among users is bound to reshape the model's structure. Frank Dzubeck, president of Network Communications Architects, Inc., a consultancy in Washington. "This is a client/server approach, but it is by no means an enterprise solution. Microsoft owns the desktop, and its databases and tools are

geared toward that. But if they hope to enter the land of heavy hitters like Oracle and DB2, they will need a different approach."

While Microsoft's plan may have some technical merit as a lower-level client/server strategy, some observers said they wonder if Microsoft fully understands the path it is embarking on.

## Remembrance of things past

"In the past, Microsoft has shown little regard for issues that concern large enterprises — like software reliability and stability and ongoing support for complex products," said Richard Finkelstein, president of Performance Computing, Inc. "Walking away from OS/2 is an indication of what they think about long-term commitment."

"SAA's big problem was that it was IBM-biased, and Microsoft's approach appears to be equally biased toward its own tools," Dzubeck said. "True client/server can't afford to be biased because there are no [single-vendor shops]."

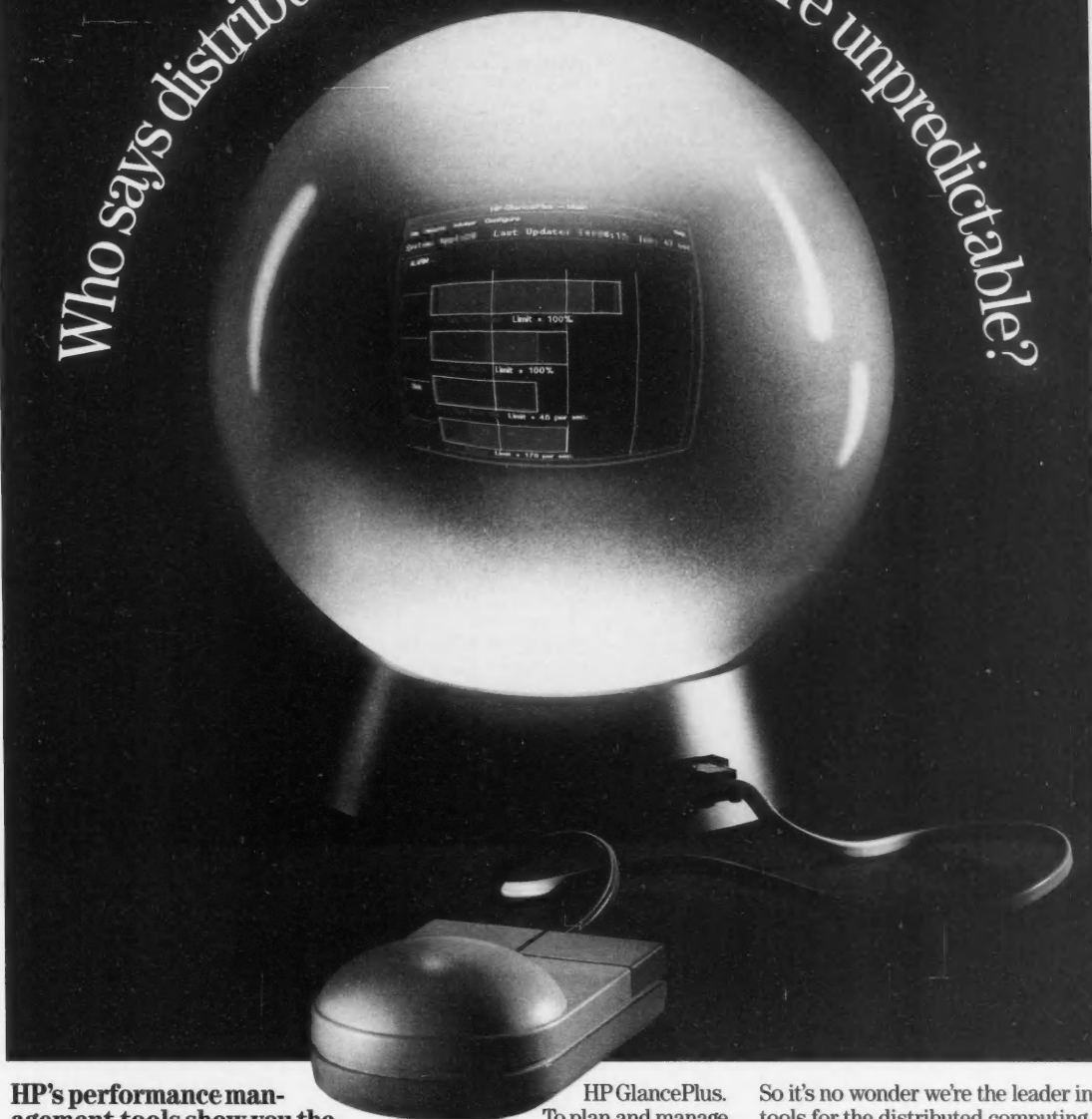
However, one piece of the strategy — the repository, code-named "Raven" — faces fierce resistance within Microsoft from other product managers who believe it will require them to extensively retrofit their own products to work with it, sources said.

**Analyst John Gantz** says Microsoft needs to ship Chicago this year. See page 35.



**Microsoft's David Vaskevitch:** The Application Structure Database will keep track of OLE

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## Workstations

# Sun plans broad outlook

By Jean S. Bozman

Sun Microsystems, Inc. is preparing a March product blitz that ranges from flashy low-end workstations with flat-panel displays to high-end RAID storage subsystems to complement its SPARCcenter 2000 symmetrical multiprocessor servers.

Industry watchers confirmed that Sun described the new products at an analyst's briefing in Carmel, Calif., last week.

The low-end workstation announcement, scheduled for next week, is intended to show Sun's ability to compete with low-end workstation entries from Hewlett-Packard Co. [CW, Jan. 24] and Silicon Graphics, Inc. [CW, Jan. 10], analysts said. "They want to get back to price/per-

formance leadership," said Jeffrey Canin, an industry analyst at Salomon Brothers, Inc. in San Francisco. "I believe we will see them utilizing packaging with an aim to bring the entry-level prices down."

## Users with open arms

Users said last week they welcome the prospect of replacements for aging low-end Sun workstations.

"About a third of our workstations will come off lease this year," said Dan Minor, manager of aerodynamic and structural application development at United Technologies Corp.'s Pratt & Whitney Aircraft Division in East Hartford, Conn. The firm has more than 2,000 Sun workstations. "This will give us more power so that some of the jobs that run on [Sun] mid-

range servers could run on the low-end machines," Minor said. The new price/performance level could cut the computing costs in half, he added.

The new units are said to be powered by MicroSPARC II chips running at 70 MHz or more to provide as much as twice the power of current SPARCclassics. Flat-panel displays would be options for the machines. Some analysts even expect infrared communications ports that would allow users to create flexible LANs without having to rewire existing Ethernet cables.

Burlington Coat Factory, Inc. has been waiting for the new machines to replace 5-year-old Sun workstations in 150 of its 205 retail stores nationwide. "We've got more than 100 of the old Sun [SPARCstation] SLCs," said Mike Prince, MIS direc-

tor at the firm's Etna, N.H., data center. "We see the SLC's 16M-byte memory limit as being a stone wall, and we're interested in replacing them in the stores." The SLC units will be reused as personal workstations at corporate headquarters, he said.

## Later this month....

Sun also plans to unveil a powerful, high-end redundant arrays of inexpensive disks (RAID) storage subsystem later this month, industry analysts said. Shipments are slated to start by June, they added.

Reportedly priced from \$24,900 to \$50,900 in various configurations, the new high-end RAID system is meant to provide reliable backup for multigigabyte databases on Sun's SPARCcenter 2000 servers. High-end models are said to support at least 30G bytes of data, according to sources.

**Sun pitches** its high-end servers for customer service applications. See page 64.

## Unix merger

CONTINUED FROM PAGE 1

should force the vendor-centric COSE group to accept formal user input, said Tony Carrato, a consultant at Mile-High Information Services, Inc. in Denver and a member of the OSF's end-user steering committee.

"To me, the significant issue is what is the way for end users to provide input, and why should anybody listen?" Carrato asked. "The reason vendors should listen is that users are the ones who buy things—or don't—buy them."

Sources close to the OSF/COSE negotiations said last week that the OSF restructuring is primarily a "business model change" that will lower the cost of sponsorship, now a \$5 million yearly bite for IBM, Digital, HP and Hitachi America Ltd. Under the plan as it was evolving last week, OSF sponsor companies would pay a much lower yearly fee and then finance individual projects depending on their needs.

## Marriage made in Unix heaven

The aim of the unification efforts is to eliminate redundant development efforts between the OSF and COSE. "Our assumption is that to achieve the maximum benefit, [you] take the speeded-up nature of COSE and marry it with the more open and structured OSF," said Ted Hanss, chairman of the OSF end-user steering committee and director at the University of Michigan's Center for Information Technology Integration. "That's what we've been working toward."

"The goal is to have a reformed OSF as a home for COSE, to give [OSF] a new lease on life," said Paul McGuckin, a Gartner Group, Inc. Unix analyst. "Sun Microsystems holds the cards there. There's still some animosity on both sides."

Sun and the OSF have been longtime adversaries in the Unix wars, and Sun Chief Executive Officer Scott McNealy has often joked that

OSF stood for Oppose Sun Forever. But the merger would be welcome news for users weary of vendor bickering.

"It would be disappointing if Sun didn't see its way to participating," Hanss said.

"They seem to be at such opposite poles of doing business," said Dave Grubb, manager for standards and technology at Lawrence Livermore National Laboratory in Livermore, Calif. "The optimistic part of me thinks that maybe end users would have a role to play and hopefully the independent software vendors as well."

## Getting central

"COSE is a process, and having a permanent group will be a catalyst for COSE-like activities," said Mike DeFazio, executive vice president and general manager at Novell's Unix Systems Group. "Having a central point to help facilitate it would be a good thing."

Still, several sources cautioned, the final details of the OSF/COSE deal are likely to be tinkered with until the 11th hour.

"The issue of exactly what's going to be said at UniForum will probably take shape 12 to 36 hours before," said Roger Gourd, vice president and chief of staff at the OSF. "A whole lot of people are talking about how many people will be on the podium."

"Sun will join a consortium that consists of the OSF members, and it will essentially be a home for COSE," said David Smith, director of Unix systems research at International Data Corp. in Framingham, Mass.

## Putting out the bait

The OSF will likely be renamed, in part to appease Sun's resistance to joining. New sponsors will likely be added. The lower joining fees are intended to induce Novell to become a sponsor, sources said, and to lure back into the fold former sponsors such as Bull HN Information Systems, Inc. and Siemens/Nixdorf Informationssysteme AG.

The OSF's new mission will be to concentrate on coordinating the development of middle-



**Tony Carrato**, a consultant at Mile-High Information Services, says the anticipated merger holds out the promise of a stronger voice for users

## COSE defined

Created last year in response to the threat from Microsoft's Windows NT, COSE is an ad-hoc vendor group that includes big hitters IBM, HP, Novell, Sun, Digital and The Santa Cruz Operation. The group, which has no headquarters and no formal organization, aims to formulate common Unix specifications that will then be blessed as open system standards by the X/Open Co.

## Seeking recruits

Novell, already an OSF member, expects more vendors to join the Unix unity effort that COSE began one year ago in San Francisco.

ware and cross-platform software for Unix, as well as other operating systems.

"Sun would have an interest in continuing to participate in the COSE process," said Michael Sears, director of product marketing at SunSoft, Inc. "If it is institutionalized in some way, Sun would have a very strong interest in looking at that."

But Sun is hanging back and withholding confirmation of its support for the new home for COSE.

"We've always had problems with OSF," said SunSoft President Ed Zander. "I think there's room for a lightweight organization that can instantiate what COSE is trying to do."

Economics are driving the move to reform the organizations. Most COSE vendors already belong to the OSF, so they are spending money twice for the same purpose. In addition, the OSF's development process was found to be inefficient.

## Looking to modify

"Technology development was [supposed] to be done within companies selected by the [request for proposal] process," Gourd said. "What happened over time was OSF became more of an engineering force. This put a constraint on the number of technologies we could be working on. We're looking at changing the [OSF] model where more of the companies could do more development work."

Users should find their hand strengthened as well. Many of the OSF steering committee members are multimillion-dollar corporations with multimillion-dollar IS budgets.

"We asked them to take our concerns and views into consideration as they worked on their restructuring plans," Hanss said. "We believe there's good progress."

Yet for some large Unix users, COSE's speed is better than the OSF's prolonged development process.

"There was an awful lot of wheel reinventing," said Mike Prince, MIS director at Burlington Coat Factory, Inc. in Etna, N.H. "And with the exception of [the OSF's] Motif and to some extent DCE, the rest of it really hasn't come to fruition. In the meantime, a lot of decisions were deferred, and the [Unix] industry has lost a lot of momentum."



**SunSoft's Ed Zander**: "We've always had problems with OSF"



## Security issues in MVS/DCE must be addressed

By Gary H. Anthes  
DALLAS

Users of an early test version of IBM's DCE for MVS generally praised the offering last week but said considerable improvements in security are needed before the OSF's DCE can be widely deployed in their organizations.

The customers, part of IBM's Early Customer Involvement Program, met at a symposium here to compare notes on their pioneering experiences with MVS/DCE. Most said implementation of the Open Software Foundation's (OSF) Distributed Computing Environment (DCE) was hard but possible with IBM's help.

MVS/DCE is a layer of services on top of IBM's MVS/ESA OpenEdition that makes MVS look like Unix to programmers and operators. Slated to ship late this year, it is intended to let users build seamless applications distributed across mainframes and Unix boxes.

IBM demonstrated an MVS/CICS order-entry application in which users at Unix-based RS/6000 workstations entered orders and queries against a DB2 database on a mainframe. Data came back to a user-friendly graphical user interface, and order transactions were triggered in CICS without the user knowing anything about MVS, CICS or DB2.

The base DCE software will be included free with MVS/ESA OpenEdition later this year, IBM said last week. It supports Remote Procedure Calls and distributed directory, security and time services. Host-based application servers will let CICS or IMS transactions interface with DCE clients but will not be free.

### Passed the test

Phillips Petroleum Co. decided to move to distributed systems two years ago and joined the MVS/DCE evaluation effort in part to test IBM's commitment to open systems, said Michael H. Guidry, a technical adviser at Phillips. "We participated in order to call their bluff."

Now that skepticism is gone. "OpenEdition and DCE are IBM's first whole-sale commitment to open systems," Guidry said. "We saw the difference when we spent two days at IBM and never heard about SAA, just OSF." (See story page 1.)

DCE's biggest security flaw is its lack of audit capabilities, according to Charles Blauner, a computer security expert at Bellcore. For example, it does not maintain a record of failed log-in attempts or enforce password expiration, and it allows an unlimited number of log-in attempts. DCE security is complex and cumbersome; adding a new user can require separate DCE edit tools, each with a different look and feel.

It is also difficult to integrate DCE security with other security products such as IBM's RACF because the internal user registry is a fixed format and cannot accommodate data from these other products, Blauner said.

"We're concerned about the audit trails DCE will provide," said John Wol-

fert, a systems specialist at Electronic Data Systems Corp. and another early user of MVS/DCE. "And the [security] edit tools are very archaic."

Ram Kumar, business area manager at the OSF, said each of these security shortcomings will be addressed in DCE 1.1, due out in December.

Mitesh Patel, a systems manager at

Bellcore, said his company will have to write code to interface RACF with MVS/DCE. "We are not happy with DCE integration with RACF," he said.

And Monika Quigley, a systems software specialist at the World Bank, said she was pleased with the results of the bank's trial of MVS/DCE but will not put the product in production until it is fully

integrated with RACF.

Pete Beggs, planning manager for distributed computing environments at IBM Canada Ltd. in Toronto, said IBM will integrate its RACF MVS security product with the security features in the OSF's DCE. This would enable automatic synchronization of the user directories in each, he said.

IBM plots expanded use of user-based pricing for host software. See page 63.

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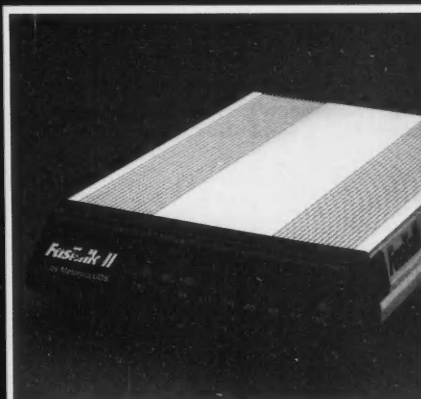
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## News Shorts

**IBM to blend PS/2, ValuePoint lines**

IBMPC Co. announced that it will unify product development for its PS/2 and ValuePoint desktop PC brands. This follows a decision made earlier this year to bring the two brands under one brand manager. This is an early step in the PC Co.'s effort to realign its brand strategy. The goal is to lessen confusion about the company's corporate desktop product offerings [CW, Feb. 28]. Analysts said the move should accelerate PS/2 development, a sore point with IBM users in the past year.

**Microsoft and TCI to test interactive TV**

Tele-Communications, Inc. (TCI) and Microsoft Corp. announced last week that they will collaborate to determine just how eager cable customers are to talk back to their TVs. In the project's first phase, Microsoft and TCI employees in the Seattle area will test Microsoft's architecture for interactive broadband networking and TCI's digital interactive networks. The second phase, which will begin in 1995, will test interactive TV services among TCI residential customers in Seattle and Denver.

**Microsoft to remove application code**

Microsoft said late last week it will remove some code derived from its DoubleSpace utility from several other products. While the potentially offending code does not actually perform DoubleSpace compression, the company is taking no chances of being attacked again after losing its patent infringement case against Stac Electronics two weeks ago (see story page 30).

**Driving prices upward**

Conner Peripherals, Inc. and Quantum Corp. raised prices on select models in their respective disk drive families last week, indicating that the price war ravaging the disk drive industry during the past year has come to an end. Conner, for example, raised prices on its 170M- and 340M-byte 3 1/2-in. drives by roughly 5%, citing increased demand and allocation for components as key reasons.

**Look Mom, no wires**

Hewlett-Packard Co. is expected to announce its entry into the wireless service market today. HP StarLink, a wireless messaging service for voice and data, will initially target HP's 100LX handheld products but over time will expand to include other vendors' products. StarLink will run over Paging Networks, Inc.'s PageNet network and Mobile Telecommunications Technologies, Inc.'s Skytel network. The StarLink service will cost between \$19.95 and \$62.95 a month when it comes on-line April 4.

**Apple cuts PowerBook prices**

Apple Computer, Inc. last week lowered prices of its PowerBook notebook computers by up to 14%. The largest reduction was on the PowerBook Duo 250 4/200, formerly \$2,269 and now \$1,959. The Model 150 4/120 was reduced 11%, from \$2,499 to \$2,219. A PowerBook Duo 270C 12/240 with an express modem dropped about \$300 in price, to \$3,299.

**SHORT TAKES** Craig I. Fields resigned effective June 1 as chairman and chief executive officer at Microelectronics and Computer Technology Corp. No successor has been named. . . . **Uniface Corp.** last week unwrapped new data retrieval and reporting tools said to allow end users to easily tap Uniface's data access features. The Uniface Personal Series incorporates technology from IQ Software Corp. in Norcross, Ga.

# Mainframes await RAID choices

IBM delays shipping RAID storage devices, leaving EMC free to gain market share

By Craig Stedman

IBM has pushed back its planned shipment of two RAID storage devices for mainframes from a second-quarter date to September. Large systems shops, therefore, will have to wait a bit longer for the expected price breaks as RAID products become available from multiple vendors.

IBM had intended to start marketing the redundant arrays of inexpensive disks (RAID) subsystems this quarter [CW, Nov. 22, 1993] but has delayed the product introduction until June due to the shipment change, said Bill Nelson, director of marketing at the company's Storage Systems division.

With Storage Technology Corp. still not ready to release its long-delayed Iceberg subsystem, EMC Corp. remains the only mainframe storage vendor shipping a disk array with RAID capabilities. EMC has sold nearly 3,000 of its Symmetrix arrays with RAID Level 1 disk mirroring support since late 1990, according to Computer Intelligence/InfoCorp in Santa Clara, Calif.

"This gives EMC free reign until June," said Nick Allen, an analyst at Gartner Group, Inc. in Stamford, Conn. IBM will be five months behind schedule and could lose five to 10 points in mainframe direct-access storage device (DASD)

market share as a result, he said.

Mike Casey, a CI/InforCorp analyst, agreed that IBM could lose that much off its roughly 60% market share, with EMC the most likely beneficiary.

**Prices should slide**

While analysts said EMC's pricing of \$5 per megabyte is aggressive for mainframe DASD, they noted that when more competitive products become available, there will

be room for prices to go lower. Customers "will eventually get better prices," Casey said. "But they're going to see it when there's multiple [RAID] competitors out there driving the prices down. Choices are somewhat limited now."

IBM would ship its pair of 120G-byte RAID Level 5 devices "sooner if we could," Nelson said. The storage hardware and RAID software are on schedule, but more work is

needed on the control unit interfaces and the system logic that will govern the RAID capabilities within the drawers that hold the disk drives, he noted.

IBM is also still trying to determine how large a semiconductor cache will be required in the disk drawers to avoid the performance penalties that RAID Level 5 typically imposes, Nelson said. Early customer shipments are not likely until August, he said.

Stan Johnson, director of MIS at Worldport LA, the port authority in Los Angeles, said a three-month delay would not keep IBM from competing for his next DASD upgrade, slated for early 1995. But he said IBM will have to price the RAID products aggressively to keep up with EMC. "It's a buyer's market out here, and people like EMC have got a real leg up on IBM," Johnson said.

Worldport LA has had a Symmetrix model for two years and is "very impressed with the equipment, not only for the price we paid

but also for its speed and maintainability," Johnson noted.

Storage Tek last fall indicated that Iceberg, originally due out in 1992, would ship early this year. A spokesman said about 15 units have been placed with early users, but the company is not promising general availability before June.

Meanwhile, Amdahl Corp. last week disclosed plans to enter the RAID market through an OEM deal with Encore Computer Corp.

**RAID roll call**

EMC has the only host RAID subsystem in general availability

VENDOR	PRODUCT	SHIPMENT DATE	STATUS
EMC Corp.	Symmetrix (RAID-1 supported)	Late 1990	About 3,000 units installed
IBM	Two RAID-5 models planned	June 1994	Delayed until September
Storage Technology Corp.	Iceberg	Late 1992	Limited shipments this year; general availability expected by June
Amdahl Corp.	RAID-5 systems supplied by Encore Computer Corp.	Expected third quarter	Letter of intent signed with Encore

## Cache me if you can

While its RAID products are in a holding pattern, IBM last week took an interim step to improve its ability to compete with EMC. IBM introduced a record caching feature for its 3990 Model 6 DASD subsystem and said it will increase the supported cache size to 2G bytes by year's end.

EMC's support for 4G-byte caches in its Symmetrix storage devices has enabled it to outperform IBM in applications that use heavily indexed DB2 or IMS databases larger than 10G bytes, said Bill Nelson, director of marketing at IBM's Storage Systems division. "There was a set of customers where our limitation in cache was a bottleneck," he acknowledged.

Record caching will let users access only a single record rather than require an entire track of data to be read into the cache, Nelson said.

With track caching only, the 3990 Model 6 is rated

40% faster than the older 3990 Model 3. But the addition of record caching will give the Model 6 up to a 200% performance edge, Nelson said.

Record caching will be implemented this month for IBM's VSAM software and will be built into the 3990 control unit by December, allowing it to be used with non-IBM databases. Cache sizes, meanwhile, are scheduled to go from the current 512M bytes to 1G byte this month and to 1.5G bytes and 2G bytes later this year.

Though IBM still will not match EMC's cache size, record caching should provide Symmetrix-like performance at smaller cache levels, said Fara Yale, an analyst at Dataquest, Inc. in San Jose, Calif. IBM's plan to make the capability standard in the 3990 Model 6 is another plus, she added.

Nick Allen, an analyst at Gartner Group in Stamford, Conn., agreed that a 2G-byte cache should be enough to make IBM competitive with EMC. But he noted that the upcoming RAID subsystems are necessary behind the cache to give IBM a smaller footprint — another EMC advantage.

—Craig Stedman

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- 3.5" 1.44MB diskette drive
- 120MB hard disk
- 9.5" DSTN dual-scan color screen
- 1 PCMCIA slot, Type III
- 86-key keyboard
- Integrated 16mm trackball
- MS-DOS, Windows 3.1
- Carrying case
- 6.6 lbs, including battery

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# Groupware piques business interest

By Lynda Radosevich

A higher-than-average number of corporate business executives showed up alongside the typical trade show mix of technology professionals at last week's GroupWare '94 conference in Boston.

Groupware, the loosely defined term

for software that fosters group communications, interests the business side of the house because it directly attacks the management and communications issues that those executives are

trying to address.

For instance, two executives at Fidelity Brokerage Services, Inc. in Boston — Mark Pawlik, director, and Scott Schreibstein, assistant vice president of opera-

tions and planning — walked the show floor in search of software to improve collaboration between their headquarters and remote staffers.

"We're just looking for ideas," Pawlik said.

Business management involvement in developing groupware applications is vital. With groupware, there is no more "throwing the requirements over the wall" to information systems, said Patricia Seybold, president of Patricia Seybold Group in Boston, in the conference's keynote speech.

"You'll get seriously offtrack unless your business management is actively engaged in, if not directing, the groupware project," agreed Michael Frow, vice president of credit at the Bank of Montreal's Chicago division.

## GroupWare '94 Boston



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### 'Note'-able releases

Announcements intended to help business and IS managers build group computing networks included the following:

• **Lotus Development Corp.** said Notes, the acknowledged bellwether of groupware, will run under Microsoft Corp.'s Windows NT operating system before year's end. The initial beta release of the NT-compatible version will ship to customers before June, according to the company.

• **CE Software, Inc.**, best known for its Macintosh electronic-mail software, announced its purchase of Powercore, Inc., a DOS- and Windows-centric group calendaring and scheduling firm. The new entity will port the calendaring and scheduling application to the Macintosh and other platforms within the next year.

Also in that time frame, the company plans to provide a middle layer of software for the calendaring and scheduling application that lets developers create workgroup applications to access information on all the major messaging and database vendors' products, according to Ford Goodman, president and chief executive officer.

• **Quality Decision Management** in North Andover, Mass., introduced an upgrade to its workflow engine for Notes. It includes tools for ad hoc creation of workflow applications such as request approvals and a new training program.

• The Irvine, Calif.-based **TeamWare** division of ICL unveiled a package that lets users organize files into folders for use on the road. When the user returns, the software, called TeamAssist, automatically synchronizes changes made to files while on the road with the original files on the office machine. The \$149 program includes E-mail.

• **Brainstorm Technologies** in Cambridge, Mass., demonstrated a \$750 utility that helps integrate Notes data with data in SQL databases [CW, Nov. 1, 1993]. It is available now.

• Officials at the **Fujitsu Networks Industry, Inc.** booth disclosed plans to deliver by early summer object drawing capabilities and Microsoft's Object Linking and Embedding 2.0 support for their \$99 DeskTop Conferencing software. The software allows up to eight users on a LAN or wide-area network to work together on any Windows application.

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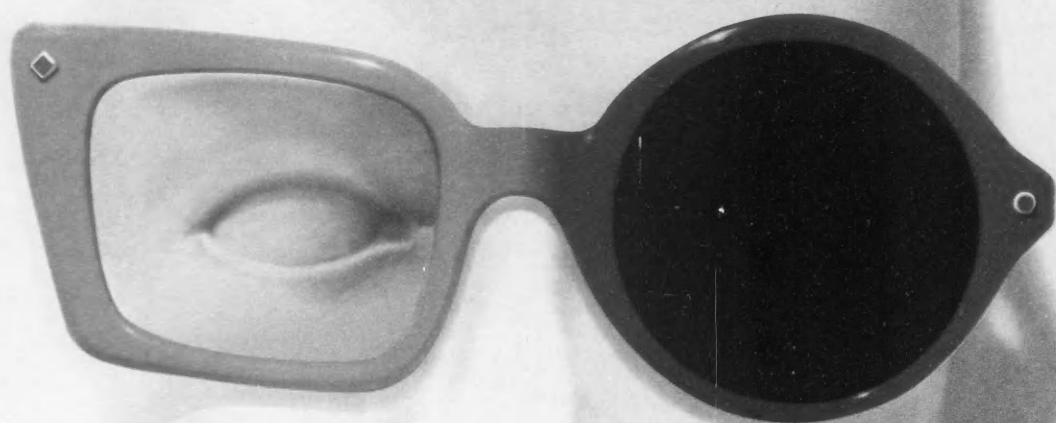
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# Japan, Inc. embraces change

*Recession-wracked companies seek relief by studying U.S. concept*

By Allan E. Alter

**J**apan, the nation that used the made-in-America concept of total quality management to rebuild its war-shattered economy, is now eyeing another Yankee notion — business re-engineering.

"Re-engineering is very much in fashion in Japan," said Kazuhiko Masuda, a general manager responsible for information systems planning at Furukawa Electric, a \$6 billion manufacturer of electronic devices and wiring based in Tokyo.

Mired in Japan's worst recession and political upheaval since World War II and motivated by hopes of finding new ways to cut costs, many Japanese — including IS executives — are showing interest in a management theory that once may have been rejected as radical and disruptive.

The Osaka-based Japan Institute of Chief Information Officers surveyed senior IS managers at 53

Japanese edition of *Re-engineering the Corporation* by Michael Hammer and CSC Consulting Group Chairman Jim Champe. The book has become a best-seller in Japan, selling more than 210,000 copies since September, according to CSC officials.

However, as of yet, few Japanese companies have undertaken re-engineering efforts, and the term is often misunderstood, observers say. Would-be re-engineers need to overcome many technical, organizational and cultural obstacles. Nevertheless, some observers say re-engineering will take off in Japan.

"Most executives of Japanese companies used to believe the recession would go away on its own accord. That's an old way of thinking," said Kuniaki Takamatsu, executive director of the Japanese CIO group. "Now Japanese executives believe the main causes of the recession come from the organization itself. [So they] must change their own organizations and business processes."

Japanese companies "are very enthusiastic to cut fixed expenses, particularly the cost of workers and employees," Masuda said. "So it is

very important to have re-engineering urgently. Of course it is not a goal we can reach in a year. But we are very enthusiastic to do this kind of planning."

## Adopting the idea

One company that has embraced re-engineering is Kao Corp., a Tokyo-based manufacturer of personal care products, cleaners, chemicals and floppy disks. Kao is seeking to eliminate, combine, replace and simplify its business processes, according to Toshio Hirasaka, director of Kao's systems development department. It is also seeking to change the corporate culture and unlock the cre-

ativity of its employees, in part by abolishing "authoritarian management."

What motivates management is not altruism but the bottom line: Management concluded in the mid-1980s that it could reduce costs no more than 15% unless it restructured business processes from the ground up.

Currently, Hirasaka is installing new client/server and end-user computing systems as part of a plan to integrate production, sales and logistics.

Other companies have begun to re-engineer their back-office processes. Furukawa Electric and Matsushita in Osaka have both re-engineered their order-entry management processes.

## Increasing efficiency

Like other Japanese manufacturers, Matsushita relies on trading companies — 28 in all — to supply its Panasonic brand appliances, stereos and televisions to Japanese retailers. The electronic data interchange systems linking Matsushita to the trading companies were not linked with one another, and Matsushita did not have per-unit-sales data, according to Ichiro Esaka, general manager of information and distribution promotion at Matsushita's corporate living sales division.

Matsushita outsourced its mainframe, order-entry and order-entry management systems to NTT Data, a unit of Nippon Telephone and Telegraph (NTT) that is a large Japanese systems integrator. NTT Data now collects sales data from Matsushita's trading partners, then consolidates and sends the information to Matsushita. This provides Matsushita with real-time inventory information and a unified order-entry process.

Matsushita now knows how many units the trading companies are selling of each product, enabling it to reduce inventory levels substantially while making sure best-selling items are always in stock.

Inefficient back-office operations are the primary target for re-engineering, according to Syracuse University dean Donald A. Marchand, who maintains regular contact with Japanese CIOs as international vice chairman of the Society for Information Management.

The Japanese have focused on factory automation for a long time but "have not spent as much time on automating other portions of the business, be they administration, office systems, field sales force, marketing or accounting,

## RE-ENGINEERING SURVEY

**T**he Japan Institute of Chief Information Officers surveyed 53 companies (of which 80% were manufacturers) at a seminar in Tokyo on Feb. 10. Respondents were CIOs at major Japanese corporations or senior IS managers.

### To what extent is your company's CIO interested in business re-engineering?

Two-thirds of Japanese companies are discussing or implementing business re-engineering.

- 38%** Business re-engineering has been discussed
- 24%** No attempt has been made to gather information on business re-engineering
- 15%** Company is already using business re-engineering techniques
- 13%** Business re-engineering is mentioned in management planning report and budget and will soon be used in practice
- 10%** No response

### Why are you interested in business re-engineering?

Business re-engineering is seen as a way to fundamentally change the way Japanese companies operate.

- 81%** It is an efficient management technique to achieve major company reform
- 11%** It has been widely applied in the U.S.
- 8%** It is frequently mentioned in leading Japanese publications

### What does your company hope to accomplish through business re-engineering?

(MULTIPLE ANSWERS ALLOWED)

Most Japanese CIOs see re-engineering as a way to cut costs, but many say they believe it will also give them a competitive edge.

- 79%** Improve productivity and thereby increase efficiency
- 60%** Increase market share and create new markets
- 4%** Maintain current market share

### Other findings:

- Nearly half of the respondents felt re-engineering can be accomplished by downsizing to PC-based networks.
- Roughly half said promoting change and an understanding of information technology trends was part of the CIO's role in a re-engineering effort.



Furukawa Electric's Kazuhiko Masuda: "Re-engineering is very much in fashion [here]"

Japanese companies in February on behalf of *Computerworld*. More than 75% of the respondents said they believe business re-engineering will catch on among Japanese companies. Many Japanese CIOs are discussing, planning or already using business re-engineering techniques (see chart).

Kao Corp., Matsushita Electric Industrial Co. and Furukawa Electric are among the companies redesigning business processes; Kawasaki Steel, Sumitomo Credit, Ryoshoku Trading Co. and Seiko Epson are among those also re-engineering, according to the Japanese press (see top story page 25).

Helping fuel this interest is the

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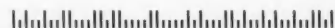
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They can make some pretty dramatic improvements in those other areas," said Evan L. Wride, director of IS at Nissan Motor Corp. in Gardena, Calif.

But first, most Japanese companies will need to invest in their IS infrastructure.

"Japan has significantly lagged the U.S. and Europe in [information technology] deployment," wrote Shuji Honjo and Frank A. Petro, two San Francisco-based CSC Index, Inc. consultants, in the December 1993/January 1994 issue of *Diamond Harvard Business*.

U.S. companies have three times the number of PCs and other end-user devices per employee as Japanese companies, according to Kenneth L. Kraemer, a professor at the University of California at Irvine who has researched Japanese and U.S. IS patterns with Petro.

Office automation is limited due to the complexity of the written Japanese language. "They are probably 15 years behind us from an office systems standpoint," Wride said.

CIOs will need to address other technical issues.

"Japanese companies retain existing work processes when they

automate. This behavior causes Japanese companies to develop expensive, inflexible custom software," Petro and Honjo wrote.

Takamatsu at the Japanese CIO group complains about the lack of integrated information systems in his country. Because of the NTT's telecommunications monopoly, Japanese corporations lack networking experience and know-how.

## Eager to change

This makes re-engineering an opportunity for Japan's IS professionals. On a recent trip to Japan, Marchand found Japanese CIOs eager to learn how U.S. companies are improving business processes through information technology and to discover which techniques have and have not worked.

For many companies, such as Kao and Furukawa Electric, getting over these hurdles will mean adopting client/server technology. Speed of implementation and superior interfaces to the user will be the deciding factors, Wride said.

But according to Yutaka Umezawa, a professor of economics at Tokyo University who has written on re-engineering in the newspa-

## The reasons are many

The following are six reasons re-engineering is one of Japan's hottest topics:

► **The economy is down...** The "bubble economy" based on high land and stock prices has collapsed. Worldwide sales revenue is down for Japanese companies, while U.S. manufacturers are enjoying a resurgence. "Our economic condition is very bad," said Yutaka Umezawa, an economics professor at Tokyo University. ...and costs must be cut. Japanese companies expanded their white-collar work force and management ranks in the 1980s. Now they need to reduce that overhead, Umezawa said.

► **Re-engineering looks innovative...** Its call for obliterating hierarchies and flattening organizations, and the use of information technology to enable new and dramatically more efficient business processes, are new additions to the idea of process improvement, Umezawa said. ...yet familiar. The emphasis on process improvement as the means to improve business performance is the bedrock of Japan's econom-

ic success. Umezawa called re-engineering "the fruit of the Japanese way of doing business laid upon the American communications infrastructure." Kazuhiko Masuda, a general manager responsible for IS planning at Furukawa Electric in Tokyo, described re-engineering as an "inverse import."

► **American publicity...** "Japanese people think the American revival and re-engineering have a strong correlation," Umezawa said. When Japanese business delegations visited U.S. car companies and other leading U.S. manufacturers, their hosts often told them they were doing business re-engineering. The Japanese are aware of the rise of *Re-engineering the Corporation*, to the top of the *The New York Times* best-seller list. ...and high-tech marketing. Computer companies and systems integrators looking for new opportunities in the midst of the Japanese recession have helped spread the word about re-engineering, said Nagayuki Yamashita, a senior consultant at the NTT Data Institute of Management Consulting in Tokyo. — Allan E. Alter

## Heading the charge

Japan's leading business publications, including *Nikkei Kogyo Shinbun* (regarded as *The Wall Street Journal* of Japan), *Nikkei Business* and *Diamond Harvard Business Review*, are ramping up their re-engineering coverage. Some of the more prominent companies discussed in the press include the following:

► **Sumitomo Credit Service**, which re-engineered its customer complaint process. Director Ohki Kunio attributed his company's success to its avoiding layoffs and focusing on re-engineering only one department.

► **Kawasaki Steel**, which has been re-engineering its sales and administrative organizations for more than a year. Its goal is to reduce its white-collar work force of 3,000 to 2,100 by March 1997.

► **Ryoshoku Trading Co.**, a major food distributor and a subsidiary of Mitsubishi Trading Co. that re-engineered its logistics process. It now assigns full responsibility for processing an order to a single person, greatly lowering costs.

► **Seiko Epson**, which began a company-wide re-engineering effort called the One Piece Project in 1991. It has changed its product development process to create replaceable laptop computer displays. Seiko Epson is using client/server technology to bring down total costs, reduce cycle times, reduce the work force and track consumer trends.

Other companies reported to be re-engineering include Casio Computer Co., Fujitsu Ltd., the Japanese Finance Corporation for Small Business, NEC Corp., Odakyu Department Store, Osaka Gas Co. and Sharp Electronics Corp. — Allan E. Alter

## QUOTABLE

“In five years, they will be back with a vengeance. The Japanese won't only be the highest quality people, but they will re-engineer and become the most efficient people as well.”

“It's all driven by the fact that sales are down, costs are up, and [Japanese companies] aren't making any money.”

Evan L. Wride, director, IS, Nissan Motor Corp., Gardena, Calif.

## QUOTABLE

per *Nikkei Kogyo Shinbun*, chief executive officer interest in re-engineering does not necessarily translate into top-level support for IS.

"There are many CEOs who do not understand the importance of information systems," he said.

CEOs also may recall failed attempts to build systems that promised to give their companies a competitive advantage, he said.

## Not easy

Gaining CEO support for re-engineering may get even tougher once they consider all the attitude and organizational adjustments re-engineering entails.

"The Japanese management style is a bottom-up style," said Nagayuki Yamashita, a senior consultant at the NTT Data Institute of Management Consulting in Tokyo.

"The employees figure out how to improve the process and their jobs. But re-engineering is top down — abolish this process, collaborate with competitors. This is difficult to accept," Yamashita said. "Japanese companies are good at quality control-type improvements, but they are not used to top-down improvements, like re-engineering."

Re-engineering will force Japanese companies to share information across functional boundaries, change corporate cultures and confront the country's lifetime employment tradition.

For these reasons, Masuda said he believes re-engineering is

something many may talk about but few will implement.

But others feel re-engineering will take root as conventional ways to change Japanese companies fail. "Most people believe the only way to reorganize Japanese companies is through re-engineering," Takamatsu said.



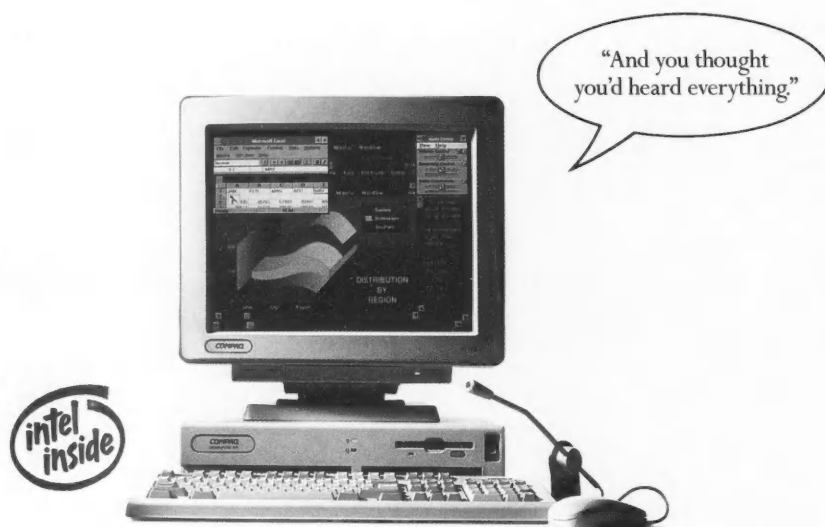
Kuniki Takamatsu, executive director of the Japan CIO Institute: "Most people believe the only way to reorganize Japanese companies is through re-engineering."

Wride said the Japanese will take to re-engineering as they took to quality management 40 years ago.

"In five years, they will be back with a vengeance. The Japanese won't only be the highest quality people, but they will re-engineer and become the most efficient people as well," he said.

The Japan Management Association Research Institute of Tokyo and New York contributed to the preparation of this article.

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# Brokerage IS shrugs off rule change

Biggest problem is late payments from customers

By Thomas Hoffman  
NEW YORK

Brokerages and other financial institutions will soon be required to settle securities trades within three days (T+3) instead of the status quo five-day period

(T+5). But that is not expected to result in dramatic changes to most firms' transaction processing environments.

Indeed, 65% of all securities traded on major markets such as the New York Stock Exchange are settled within 24 hours. The effort to reduce the maximum

time allowed for settlements was designed to improve the industry's ability to manage credit and risk, said Harold C. McIntyre, managing partner at The Summit Group, a New York consultancy.

But the June 1, 1995, compliance date set by the Securities and Exchange Commission weighs on the industry, as leading brokerage houses grapple with ways

to subtly induce clients to speed up investment payments, according to information systems executives who attended the Second Annual Systems and Data Management Strategies for Securities Operations and Processing conference here last week.

"T+3 compliance isn't so much a systems-related issue as it is client-oriented," noted Gary Sheehan, a senior vice president at Lehman Brothers in New York. He said Lehman Brothers will not have to enact wholesale changes to its systems to shorten its settlement cycle by two days. Instead, Sheehan and his peers said any settlement delays their organizations face will likely stem from their clients' inability to make timely payments for the trades they order.

## CICS switch

Still, some systems modifications will be necessary for brokerages to meet the shortened cycles. The bulk of those changes will consist of tweaks to the IBM CICS software that most investment firms use to process and route batches of trades to clearinghouses.

Sheehan and other IS executives said they believe their firms' mainframe batch-oriented systems could meet the T+3 requirements, but McIntyre suggested that the regulation will provide brokerages with an incentive to convert their host back-office systems to speedier distributed environments.

"Firms will not have the luxury of time that they have today. Back-office overnight fixes [to securities settlements] will eventually have to change to real-time workstation-based corrections," McIntyre said. He added that neural networks, once a pie-in-the-sky technology in financial circles, have matured enough to warrant consideration for securities reconciliation.

All of which circles back to timely payments from clients.

"Many customers still rely on the U.S. mail for their payments. If we have trouble receiving their payments to meet T+5, how are we going to get that done in T+3?" asked Margaret L. Koontz, executive director of the U.S. Working Committee Group of Thirty Clearance and Settlement Project, a New York industrial consortium that is spearheading research on the industry's most pressing clearance and settlement issues.



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# Computer Industry

## Briefs

### Dell fortunes sink

**Dell Computer Corp.** posted a loss of \$40 million on revenue of \$2.9 billion for fiscal 1994 ended Jan. 31. That compares with \$101 million in profits on \$2.01 billion in sales for fiscal 1993. Fourth-quarter sales fell 2% from the third quarter, which Dell blamed on a 58% decline in its U.S. government sales. Analysts noted that Dell has seen unit growth drop every quarter since the October 1992 quarter when unit growth hit 149%.

### Micrografx loss

**Micrografx, Inc.** reported a loss of \$1.1 million on revenue of \$18 million for its third quarter ended Dec. 31, 1993. That compares with a net income of \$1.3 million on revenue of \$17.9 million for the same period in 1992.

### Sales slump at AST

**AST Research, Inc.** told analysts last week that its U.S. demand has been weaker than expected, causing its growth rate to slow from an expected 70% to only 60%, which will throw off earnings per share by roughly 13 cents.

**SHORT TAKES Metro Wireless Interactive Corp.** in Los Angeles said it intends to purchase **Lightwave Products, Inc.** in Simi Valley, Calif. . . . **Electronic-mail supplier CE Software, Inc.** said it will acquire all the assets of **Powercore, Inc.**, a provider of group scheduling and calendaring software. . . . **Ziff-Davis Electronic Information** has acquired **Sandpoint Corp.**, a developer of data access, retrieval and integration software. . . . **Sun Microsystems, Inc.** has appointed Chet Silvestri president of its SPARC Technology Business Unit. . . . **NuMedia Corp.** in Alexandria, Va., has named Steven D. Roth, 42, president and chief executive officer. He succeeds Arthur G. Esch Jr., who will remain as chairman.

## Patents may be key to survival

By Ed Scannell and  
Stuart J. Johnston

Having scored an unprecedented win over Microsoft Corp. in its patent infringement suit, Stac Electronics said it believes its action has set an example for other small companies seeking to protect their ideas.

Late last month, a jury in U.S. District Court in Los Angeles awarded Stac \$120 million in damages [CW, Feb. 28]. It ruled that Microsoft had infringed on two of Stac's data compression patents in its best-selling MS-DOS 6.0 and 6.2 operating systems. This suit was the first patent infringement trial against Microsoft to reach court.

Consequently, Microsoft has removed from MS-DOS its DoubleSpace data compression utility, a capability it considered an important selling point when it introduced MS-DOS 6.0 in April 1992.

### Effective barriers

Noting his successful suit, Gary Clow, Stac's president and chief executive officer, contended that too many small companies do not seriously consider patents to be an integral part of their competitive strategies. He maintained that patents can be an effective mechanism for erecting barriers against large competitors trying to muscle into markets.

This is a switch not often seen in the microcomputer software industry, where large companies get to build walls around their market share by using massive installed bases and aggressive pricing strategies to keep small companies small.

"I think we have shown a prototype for how small, innovative companies can compete," Clow said. "We have shown the way

for securing patents for intellectual property against a very strong competitor."

Companies making a commitment to protect their patents should either have deep pockets or hope they win a sizable settlement. For instance, Stac spent a little more than \$7 million defending its patents in the Microsoft suit.

Clow acknowledged that the suit has done significant damage to his company. "We presented evidence at trial [about]

ing the 17-year life of a patent.

"It may be time-consuming and somewhat expensive," Clow said, "but what are your options? If we didn't obtain a patent in this case, we would be out of business."

### Problems remain

Despite Clow's bravado, some observers said they see the win as a double-edged sword that could cut both ways.

"I would like to see a new form of software protection. I think patents will have a chilling effect on software entrepreneurs because they generally provide an advantage to bigger companies," said John Yates, a partner in the corporate technology group at Morris, Manning & Martin, a law firm in Atlanta. He said the case provides "a way for smaller companies to survive."

One thing Yates and others said they would like to see is highly technical trials judged by jurors with some degree of technical awareness. The Stac/Microsoft suit was decided by a seven-person jury, only one of whom had any technical literacy.

Somewhat clouding Stac's victory, however, is the counterclaim the court awarded Microsoft at the same time it handed down Stac's win. Stac was found to have misappropriated trade secrets from Microsoft and to have incorporated them into versions of Stacker 3.1 and 4.0.

Both companies have filed injunctions that may result in a recall of all copies of MS-DOS 6.2 and Stacker 3.1 and 4.0 now in distribution channels. If the court grants both injunctions—a decision that may not be known for another week or two—Stac could get hurt the most.

"This absolutely could put Stac out of business, but judges are not usually inclined to grant injunctions that" would do that, Yates said.

Trial and error	
OTHER NOTABLE SUITS AGAINST MICROSOFT	
Apple Computer, Inc.	Z-Nix Co.
<b>Allegation</b> Windows 2.x and 3.x violated the copyright on the Macintosh interface	<b>Allegation</b> Antitrust and breach of contract in Windows distribution agreements
<b>Status</b> Ruling in favor of Microsoft, June 1993; now under appeal	<b>Status</b> Settled out of court, November 1990

Source: Gates, Doubleday, New York

that our financial loss has been. But what you can't measure is the damage it does to a company on a steep growth path. We had to lay off 20% of the company after [MS-DOS 6.0] shipped," he said.

Stac's revenue was slightly more than \$40 million in 1992, an increase of 203% over its \$13 million in 1991, according to "Soft Letter," an industry newsletter in Watertown, Ma. Stac's revenue for 1993 was \$36 million, a company spokesperson said.

In addition, there are other minimal costs associated with obtaining and maintaining patents. For example, once inventors have obtained a patent, they have to pay maintenance fees totaling \$7,000 dur-

## MCI buys into wireless with Nextel

By Ellis Booker

■ **MCI Communications Corp.** bought itself a seat at the wireless table last week, investing \$1.3 billion in a radio-dispatch company called **Nextel Communications, Inc.** in a bid to construct a nationwide digital wireless system.

But MCI's investment, much like AT&T's ongoing \$17.6 billion plan to acquire cellular giant McCaw Cellular Communications, Inc., is fueled more by known demand for "mobile dial tone" and the economics of telephone-access rates than by any immediate opportunity in data services, analysts said.

### Putting on the pressure

Still, at least one heavy user of cellular voice and data services predicted the biggest benefit of the MCI/Nextel deal will be the competitive pressure it will put on AT&T/McCaw and other wireless carriers to provide nationwide coverage.

"Everyone says they [do], but the reality is there isn't [na-

tionwide coverage]. I think this will force everyone to fill those dead holes," said Dick Bradner, manager of network services at Progressive Casualty Insurance Co. in Cleveland. Progressive spends \$500,000 annually on cellular voice and data, and it has equipped about 700 of 1,500 laptops used by claims adjusters with cellular modems.

Bradner said the fragmented coverage, ownership and pricing of existing cellular systems complicates his job.

Long-term wireless networks are appealing to long-distance carriers such as AT&T and MCI as yet another way of

bypassing the local exchange companies and their access charges.

Nextel's first all-digital network, which provides voice, two-way paging and dispatch radio, was switched on earlier this year in Los Angeles.

The company, which is partly owned by cellular vendor Comcast Corp., has promised statewide service in California this year, as well as systems in Chicago and New York.

Under terms of the MCI/Nextel agreement, MCI will purchase approximately 17% of Nextel's stock, matching Comcast's ownership. Motorola, Inc. will provide the radio infrastructure and handsets for the new network.



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## A polished approach

As Steve Jobs, Gene Amdahl, Michael Jordan or any other would-be two-timer would tell you, it's awfully hard to be successful twice.

The tendency is to employ the same strategies and tactics that made you successful the first time around when you reach for the brass ring the second time.

Apple, the company that pioneered ease of use and the graphical user interface revolution, is in dire need of another meal ticket. Next week, Apple will try to become successful a second time as it attempts to eclipse its 10-year-old, franchise-making, proprietary Macintosh with a radically new architecture, the Power Macintosh (see story page 1).

The big question on everyone's mind is the extent to which the Power Mac will be backward-compatible with the billions of dollars' worth of software and peripherals that customers have invested in. Last week, the trade publication *MacWeek* published an "exclusive report" touting lab tests that showed backward compatibility that "exceeds expectations."

Meanwhile, *Computer Reseller News* published a piece showing Apple chaotically scrambling to fix serious compatibility problems. Yet another report citing internal Apple documents claimed the company is about to embark on a three-year operating systems upgrade that will (eventually) bear fruit such as full support for Novell's NetWare on servers. Gee.

So it appears that, if nothing else, the company is relying on some time-tested tactics such as FUD, or fear, uncertainty and doubt.

Having lost most of its uniqueness and therefore its ability to make much money to sustain product development efforts over the long haul, Apple must learn some new strategies if it hopes to be even marginally successful in the corporate world.

For one thing, speeds, feeds and other esoteric muscle features that Apple has been touting mean nothing to corporate IS, which knows full well that such claims to first place are forever being one-upped. Promises of support for widely used network schemes merely bring Apple even with the IBM-compatible world.

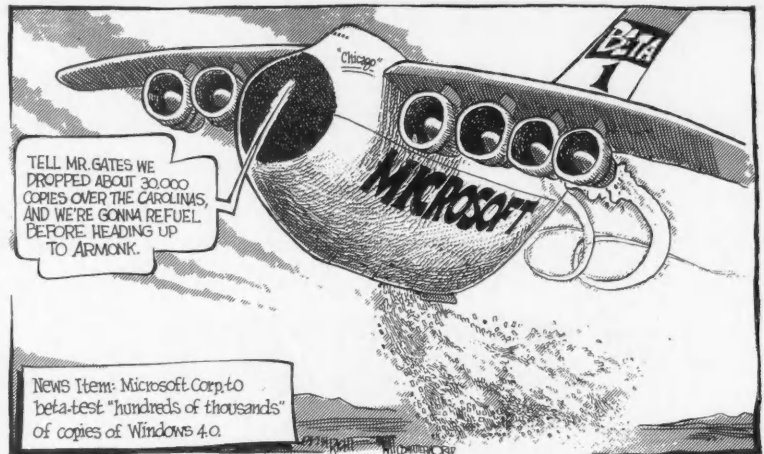
Apple has an opportunity to present IS with a machine and an architecture that in fact promise some uniqueness—namely, the ability to be either Mac-or-IBM-compatible and work with each reasonably well. This should give Apple a chance to shed its well-earned image as a corporate niche player, which is all it has been.

But the company also has to shed its image as a toy-maker to be taken seriously by IS. Apple's failure with its \$900 handwriting nonrecognition gizmo, called Newton, didn't help in this regard.

Most important, Apple must change its image as a company profoundly disinterested in learning about corporate IS and the IS way of doing business (cautiously and prudently). Apple's IS consulting efforts have been feeble at best. In short, Apple still needs to rethink itself as well as its machines.

*Bill Laberis*

Bill Laberis, Editor in Chief



## Happy birthday

It was quite entertaining to read your retrospective on the Macintosh ["The Mac turns 10," CW, Jan. 10]. It is easy to understand the frustration of the original Macintosh minds. The PC applications and hardware architecture are massive, grotesque and powerful. The high-end Intel 486 and Pentium machines are like the Mig-25: Two awesome engines strapped on a Stone Age frame.

The imagined world of a triumphant Macintosh may not be any better. The finely crafted appearance of the Macintosh operating system has always been balanced against inexcusably slow performance. And the Macintosh interface has become stale over time.

In 1985, when I was looking to upgrade to the world of 16-bit machines, I pitted the clones and Macintoshes against the less-covered Amiga and Atari ST machines. The Amiga outperformed the Macintosh despite the Macintosh's 10% faster clock speed. The Amiga also had tremendous graphics performance and a preemptive multitasking operating system. Although the Amiga operating system was not finely crafted like the Macintosh's, it was more powerful, and the advanced Amiga hardware architecture showed how pedestrian the Macintosh hardware was.

To borrow from a letter-writer more eloquent than I, Commodore has the marketing of a third-world fruit stand. I believe the computer press has played a part in this by being followers of trends rather than reporters of significant events. Imagine the press sparking interest in the developing tech-

nology of 1984-85 and the user community rapidly getting a PC that has the finely crafted, consistent interface of the Macintosh, the multitasking kernel and elegant hardware of the Amiga and the raw power and a bazillion apps from the clone world.

Bradley W. Hulyk  
Katy, Texas

## Family value

Bob Mahony's letter equating the ability to work at home with an undermining of family and personal time [Letters to the Editor, CW, Jan. 10] misses the mark.

My kids go to bed at 7 p.m. If I work until 6:30 p.m. every day, I'll never get to see them awake. Today's technology allows me to go home at 5:00, be with my family until 7:00 and then start working again for an hour and a half. I can also work from dawn to 7:30 a.m. and have breakfast with them.

Modems, fax and voice mail help me fulfill my responsibilities as a husband and father, not evade them.

Lenny Liebmman  
Highlands, N.J.

## A dangerous game

In your interview with Michael Hammer ["One on One," CW, Jan. 24], you said, "Consultants Paul Strassmann... have leveled sharp critiques. Your response?"

Hammer answered, "Some people find it a useful way to get atten-

tion. If you stand up on your hind legs and make rude noises about something, that has a certain amount of attention-getting capability, even if you don't have anything to say... Some people are motivated by that... to help their identity."

My critique of Hammer has appeared in two articles. I pointed out that his unique contribution to managerial theory was in the insertion of organized violence into recommended business practices: "Re-engineering... will require a personality transplant... a lobotomy," [CW, 1987].

"How do managers contemplating a big re-engineering effort get everyone inside their company to join up?" "On this journey we... shoot the dissenters," [Forbes Magazine ASAP, 1993].

"The way you deal with resistance [to re-engineering] is... a bloody ax. Al Capone once said, you get further with a gun and a kind word than with a kind word alone," [Across the Board, June 1993].

The above citations are only a sample of his pronouncements.

The anxiety of survivors of re-engineering is perhaps the principal reason why companies do not realize the gains they originally planned for.

Paul A. Strassmann  
New Canaan, Conn.

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## Viewpoint

# America's socialist backlash

Jeffrey Gordon Angus

What do Fidel Castro and U.S. IS managers have in common? In a world where everyone else fervently believes in the benefits of a free market, Castro and computer professionals tenaciously hold on to socialist solutions.

Take vendor technical support, for example. Unlimited, free technical support is a perfectly socialist construct: Every customer

chips in the same share (a piece of the purchase price) for the cost of technical support, and each customer draws on support services to the degree needed. Intensive users, moderate users and nonusers all pay the same for technical support. As Karl Marx, paraphrasing Jesus, said, "To each according to his needs."

While Eastern European economies began to embrace the free market system, an attempt by the computer industry's purest capitalist, Borland CEO Philippe Kahn, to employ free market principles drew howls and hisses in the

U.S. marketplace. Kahn slashed software margins as a competitive tactic. But when Borland tried to regain some margin by charging extra for support beyond certain baseline limits, it touched off a firestorm of protest from customers who had come to expect unlimited support.

According to "PC Pulse," a newsletter from InfoCenter Market Research in Aurora, Colo., the pay-for-use technical support plans came into the market just as significant numbers of

corporations were pursuing the downsizing fad by laying off internal training and support personnel. Since free support was available from system vendors, these folks had begun to seem expendable. Is it any wonder that about 40% of users told InfoCenter they wouldn't buy from vendors that charge for support?

What we have here is a classic 1980s/1990s American middle-ground standoff.

Everyone wants to socialize as many costs (on the backs of suppliers, customers and taxpayers) as they can while paying the minimum for products and services. Here, the only way

to win is to make sure everyone else pays for your actions while you avoid paying for theirs.

Like employers who cut health benefits, thus shifting medical costs to the taxpayer, IS managers were reaping the benefits of free support while reducing short-term costs.

Now that Microsoft and WordPerfect have joined the pay-for-support ranks, conventional wisdom says free support is dead. In a transition to largely paid support, vendors get to sell cheap software without paying to support the increasingly naive users moving into the market or the undersupported ranks of users in downsized firms. Temporarily at least, bottom lines are enhanced, and there's less incentive to improve the quality of products because technical support is no longer a cost center.

What comes out of this for the consumers? In the short term, the pain of accountability and the need to examine in-house training and support needs and balance those against the cost of paid support.

Periods of transition are always hard, but all this will lead to a healthier balance. At some point, free support will come back — not as a right but as a competitive offering. That is exactly the way it should be in a capitalist system.

Angus is a systems analyst at The Data Works Ltd., a Seattle consultancy. He serves on the board of Earth Second Economics Institute, an economics research organization.

*Unlimited, free technical support is a perfectly Marxist concept, with each customer paying the same share but taking as he needs.*



# Chicago: Will users buy into Microsoft's plans?

John Gantz

With all the media furor over the coming — and nearly going — of Windows NT last year, one would have thought Bill Gates had bet his whole company on the VMS look-alike. In fact, he didn't. NT is just another 32-bit operating system, and Microsoft can live without it.

But now Microsoft is faced with what may truly be a bet-the-company upgrade — to Chicago, the follow-on to Windows 3.1. While there is debate among pundits over when Chicago will ship — this year or next — and what features it will encompass, there is one inexorable force at work on Microsoft. Namely the need to feed the revenue beast. Last year was a good one for Microsoft in terms of new products — Access, Windows NT, Office 4.0 and Visual C++ all came on-line. Microsoft needs a follow-up act this year, and in the systems arena, Chicago is it.

If Microsoft's Steve Ballmer is only half-right when he says he expects 50% of Windows users to upgrade to Chicago the first year, that's as many as 10 million users. The installed Windows base was more than 35 million by the end of 1993. Getting that installed base to spend money on Chicago could mean a billion dollars to Microsoft in the first year of its shipments. So Microsoft will do whatever it can to get Chicago out the door this year, even if it has to drop

some features or scale back on the new GUI that is supposed to come with Chicago.

Let's say Microsoft plans to get Chicago to market as fast as possible. Will the buying public go along?

Well, it's too early to poll users on purchase plans — the Chicago beta isn't even out yet. But it's not too early to get a feeling. This year, my company launched a major study of Windows users and developers, and we have already discovered:

- Users see Chicago, not NT, as the natural upgrade to Windows.

- More developers than you might think are committed to either the full Win32 API or Win32c. Application vendors are afraid to miss the next major upgrade cycle, even if it means having different development teams for the different Windows APIs.

- Corporate developers don't believe it will take them as long to develop Chicago apps as it did Windows apps. The major part of the GUI learning curve is past.

So, Chicago will happen the way NT didn't. Microsoft has too much riding on it. Remember,

Excel, Word and Office for Chicago will bring in more money than the operating system itself.

Within two years we will have a ubiquitous 32-bit operating system running on desktops and a whole bunch of new applications taking advantage of it. This, in turn, will increase systems management and application development and management headaches by several orders of magnitude (and generate a new hardware upgrade cycle, even if Chicago itself can run in 4M bytes of memory).

I also expect that when corporate America evaluates this upgrade it will be appalled at how much mission-critical work is already being done in the trenches under Windows. This will be more impetus to migrate. Better a 32-bit operating system on the desktop in that case than DOS with a pretty face.

Gantz is senior vice president at International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.



*There is one inexorable force at work on Microsoft. Namely the need to feed the revenue beast.*





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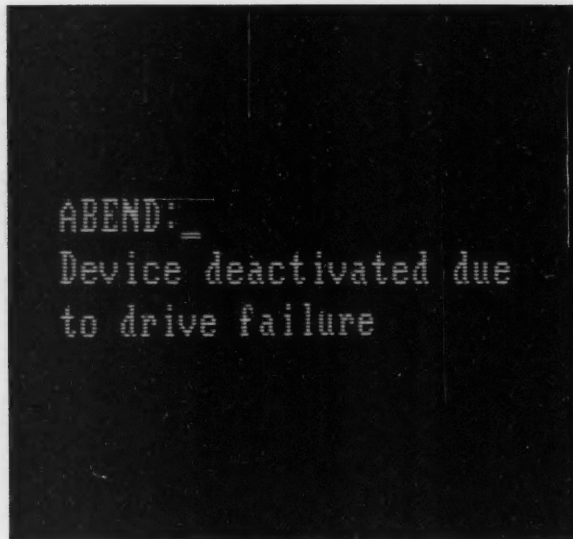
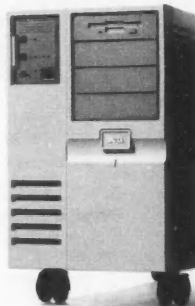


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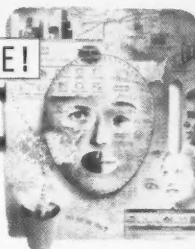
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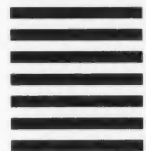
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## Laser printer trends go beyond price

Low-end prices fall while ease-of-use features emerge

By Stephen P. Klett Jr.

■ In 1993, several laser printers debuted for well under \$1,000; a few even broke the \$500 barrier. But while the downward pricing spiral is expected to continue, analysts point to advancements in printing from Windows environments, color capabilities and networking as the most important trends users will see in the next year.

"The single biggest future trend we're starting to see now in the laser market is the capability to print through Windows," said C. J. Meiser, senior market analyst at BIS Strategic Decisions in Norwell, Mass. "This has long been a horrendous task for users."

Last summer, Microsoft shipped the Windows Printing System (WPS) 1.0 — a replacement for its standard Windows driver that dramatically boosts the speed of Windows printing by off-loading some print functions to the host PC. Developed with Hewlett-Packard Co., WPS includes a cartridge — in addition to 32-bit driver software — that plugs into a LaserJet printer.

### One step easier

Previously, when a page was sent to a printer from a Windows-based workstation, the printer's driver software had to translate the page into code the printer could understand. WPS cuts out this step by enabling the printer to work directly with data that Windows uses to build its screen images.

HP in charge	
Hewlett-Packard is the overwhelming leader in the low-end U.S. laser printer market	
LESS THAN 8 PAGE/MIN.*	
Percent of the market	
HP	51%
Apple Computer, Inc.	12%
Epson America, Inc.	8%
Okidata Corp.	8%
Other	21%
Total units shipped: 1.6 million	
Average price: \$1,000	
8-11 PAGE/MIN.*	
Percent of the market	
HP	69%
Apple	12%
Lexmark International, Inc.	6%
Other	13%
Total units shipped: 858,000	
Average price: \$1,500	
Half of all laser printers are going into networked environments and 35% of them are shared on the network	
*Preliminary 1993 figures	

Source: International Data Corp., Framingham, Mass.

The result, Meiser said, is that "for the first time, an 8 page/min. printer can print 8 page/min. no matter what is thrown at it — including graphics." Meiser estimated the boost in speed at 20% for general business graphics and at least 100% for a page with text and small graphics, such as a logo.

The improved Windows capabilities and explosion in the growth of LANs are also leading to increased emphasis from vendors on incorporating networking capabilities into their machines,

such as integrated network interface cards and diagnostic and management features. While this trend is mostly on the high end at the moment, analysts say they expect it to migrate down to desktop lasers in a year or two.

"Right now, only 8% of users purchase a network interface card with their laser printers," said Angela Boyd, an analyst at International Data Corp. "However, that number can be as high as 60% for the higher-end, 17 page/min. products," she added. "Right now, most low-end products are used as personal printers, and a few are shared in small workgroups of eight to 10 users."

### Eroding prices

WPS has also had a major impact on driving the price erosion in the market. WPS "means printers don't need a lot of horsepower so vendors can take a lot of cost out of the box," Meiser said.

This is critical to vendors' ability to deliver affordable products that keep up with the market's growing emphasis on graphics output, according to Tim Craig, product manager of midrange and network laser printers at Lexmark International, Inc. in Lexington, Ky.

"By off-loading functions to the host PC, we can build very low-cost printers at the same basic price levels of previous models but with much more functionality," he said.

For example, users are starting to see 600 dot/in. laser printers at 300 dot/in. price points.

In addition to speed, WPS offers management features such as graphically showing the location of paper jams and the status of print jobs on users' screens.

But it also has its drawbacks. For example, status messages cannot be sent to network users and therefore are limited to stand-alone PCs, and the WPS cartridge is compatible only with HP's LaserJet family.

### Fix on the way

However, Microsoft says a fix is in the works for the former, and third-party support for WPS is now appearing. For example, Lexmark's roughly \$1,350 WinWriter 600 incorporates the WPS code directly on the motherboard. Furthermore, WPS clones are starting to appear, such as the WinStyler GDI from Destiny Technology Corp., which NEC Corp. uses in its \$1,400 SuperScript 610 machine. Analysts say they expect everyone in the low-end printer market will

Laser trends, page 41



### Breaking barriers

This year vendors are striving to break the \$500 low-end laser printer barrier. Those that have succeeded so far include the following: Okidata Corp., Texas Instruments, Inc., Sharp Electronics Corp. and Panasonic Communications and Systems Co.

## At what cost, color?

Implementing color capabilities in desktop laser printers at reasonable price points is a challenge that remains unanswered, and some observers question whether it will ever be resolved.

One of the toughest nuts to crack is color fidelity. "Ensuring the same purple you get today is the same you will get next week is a tough problem for us as an industry to solve," said Tim Craig, product manager at Lexmark International in Lexington, Ky.

Lasers are more vulnerable than other nonimpact printers to variables such as room temperature, which can have an effect on color composition.

But perhaps the singular biggest problem is variation in the size of toner particles, and Craig said it remains unclear whether it can be solved in desktop machines. The method used to combat this problem in high-end printers is too expensive to replicate in a personal printer.

Progress is being made. For example, QMS, Inc. in Mobile, Ala., recently started shipping a color laser printer called the ColorScript 1000 with a street price of less than \$10,000, expected to drop to less than \$5,000 next year. But this is still a far cry from ink-jet printer prices and may be too much of a gap to breach.

While the color laser printer is likely to always have a place because of its superior image-reproduction capabilities, its days in the low-end market may be numbered. "If the color ink jet continues on its path of better and better print quality, the laser market will dry up because it simply can't compete on price," said C. J. Meiser, a senior market analyst at BIS Strategic Decisions.

—Stephen P. Klett Jr.

## An office combo that does it all

One development that analysts expect to see during the next year is the emergence of integrated office systems that will do just about everything a user could ask — except maybe brew a pot of coffee.

QMS, Inc., for example, recently started shipping a Windows-based desktop office system that combines computing, scanning, copying, data communications and fax capabilities into a single box. Okidata, Inc. has been shipping a similar system called Duo-It for roughly a year. It also integrates fax, scanner, printer and copier functions.

The QMS 2001 Knowledge System is offered in two configurations: one with a self-contained 486-based PC and one that uses an external PC. Both models include an image processing computer

that off-loads imaging tasks to an Intel Corp. i960 processor.

The system was designed to integrate a wide array of future options such as voice, telephony, audio, video and network connectivity to perform such tasks as managing voice mail, videoconferencing and sending video messages.

"This is a very interesting product because all you have to do is hook up your monitor and keyboard and you have your entire office right there," said C. J. Meiser, senior market analyst at BIS Strategic Decisions. Meiser said he expects several other vendors to jump into what is shaping up to be "a promising market" during the next year.

Both versions of Knowledge System are available now starting at \$3,999. —Stephen P. Klett Jr.



# PC Co. program slow to deliver

Premium Partners creators plan improvements

By Michael Fitzgerald  
SOMERS, N.Y.

Some babies take longer to learn how to walk than others. IBM PC Co.'s Premium Partners program turned 6 months old recently, and it is still having problems with its motor functions.

Premium Partners, a PC Co. effort to guarantee stable, efficient supply to major customers with large project rollouts, was announced last June; it began operating in September.

Oriented largely toward PS/2 buyers, the program has in some cases also covered projects that use ThinkPad notebooks and even PS/ValuePoint PCs.

Information systems professionals in PS/2 shops said they like the idea but have some problems with the program's execution, particularly in supply and communications.

"We signed up because it's supposed to make purchasing — and support of equipment once it's installed — easier and cheaper," said Bruce I. Linker, vice president of IS at a large financial services company in New York and president of the Microcomputer Managers Association.

Linker said his company only recently signed on to the program so he could not

comment in detail about how it worked. He did say he hoped it would prevent episodes like the PC Co.'s recent fiasco with Models 76 and 77 replacements [CW, Dec. 27, 1993/Jan. 3]. The company had shifted production from the old model to a replacement model, then found a problem in the new model and pulled it from production altogether.

"We have to wait so long for equipment right now," Linker said, adding that by giving IBM a purchasing forecast, his shop hopes to get what it wants when it needs it.

## Delays to end soon

Stuart F. Cohen, the PC Co.'s director of commercial desktop brands, said that while the PC Co. will continue to have delivery problems even for Premium Partners, he expects those to end by June. He conceded that Premium Partners "is not perfect" but that IBM is auditing the program now to see where it needs improvement.

Premium Partners members get their products through the traditional reseller

channel, and resellers have criticized the program. One official at a major Northeastern reseller, who asked not to be named, said the program has improved since it started and now works — but works in spite of itself.

The official explained that Premium

Partners members get the right number of systems if they "completely overinflate their forecasts beyond what they'd ever need." He said his dealer organization encouraged customers to do this and so was occasionally able to get extra product to distribute to less-privileged customers.

## Who gets in

A source at IBM suggested that because the Premium Partners program is driven by IBM's traditional blue-suit sales force and not resellers, some resellers are not happy with it. The source said tensions arise when IBM doesn't nominate the resellers' favorite customers for the Premium Partners program.

Besides erratic delivery, Premium Partners is also criticized for what some say is irregular customer contact: Some obvious Premium Partners candidates

are not even aware of the program.

For instance, Sears, Roebuck & Co., one of IBM's largest customers, is not a participant and the program "only recently came to our attention," a spokeswoman said.

## Inconsistent contact

Bert Bolduc, Eastman Kodak Co.'s manager of corporate sourcing for information technology, said his company had to call IBM to get information on the Premium Partners program. It turns out Kodak is not interested in it because the company was told that the program is geared toward mass rollouts of 3,000 systems or more and is largely oriented toward PS/2s.

However, IBM may not have contacted Kodak because Kodak does not purchase many PS/2s.

"This program is 6 months old, and we are making some changes in it," Cohen said. He added that while the PC Co. has rolled out Premium Partners to 100 customers, about half the number intended, the program is currently on hold as IBM gauges how well it is working and what needs to be improved.

Observers gave the PC Co. credit for doing a better job of keeping its delivery promises (except for Models 76 and 77). The company also received kudos for reducing buying requirements, which initially were multiple thousands of systems. It now has several tiers, including annual purchase promises for 2,500-plus units, 2,500 units and 1,000 units.

David Coursey

## Borland in recovery



Thought much about upsizing lately? I didn't think so. How about publish-and-subscribe as a work-group metaphor? Really? Somehow that doesn't surprise

me, either.

Turning upsizing and publish-and-subscribe into front-of-mind issues are two challenges facing Borland as it tries to emerge from a persistent blue funk caused by the habit of failing to execute its product marketing very well. (Read: Borland has screwed up.)

Yes, Borland shares are selling today in the low teens (down from \$70 or so less than a year ago) because the company has cratered the old-fashioned way: by earning it.

## Maybe a miracle

Given this situation, convincing IS managers — good cynics like yourself — that Borland knows best when it comes to client/server development, languages and

desktop/departmental databases is no small order. But if the unannounced products I've seen can become the company's next "best of breed" software, Borland may just pull it off.

It's easy to be down on Borland these days. The merest mention of the company brings laughter in some Silicon Valley salons. Borland's missteps include the recent mess over a licensing agreement for C++ that was supposed to jerk Lotus around but incensed corporate developers instead, and its low-ball pricing of Quattro Pro for Windows. Such mistakes are credibility killers. The same goes for dBase for Windows, years in the making and headed for a last-chance ship date this summer.

## Band-Aids are coming off

But while it's easy to make fun, the important thing is this: Perception trails reality, and Borland is on the mend. I can't offer lots of solid evidence today, having just signed a stack of nondisclosure agreements covering a year's worth of products. But after seeing many demonstrations, visiting with 11 vice presidents and spending hours with CEO/President/Chairman Philippe Kahn and Chief Technology Officer Richard Schwartz, I'm impressed.

I've seen most of the products Borland has planned for the rest of the year, and they all seem like good ideas. I doubt there's a next-generation "killer app" in the bunch, but Borland's tradition of producing first-rate products — even if they generally come out late — isn't likely to

be damaged. While Borland has lacked marketing and management savvy, its technology remains first-rate. And which would you rather have: great marketing or great code?

Sure, Borland has to work hard to make good on the promise of its upcoming products. I'm not expecting much action for six to eight months, so things at Borland will probably seem to get worse before they improve.

Here's my guess as to how this will play out: If dBase for Windows makes a summer ship date, the cloud over Borland will lift considerably and revenue will spike as customers upgrade. Quattro Pro will continue as the No. 2-selling Windows spreadsheet, pushing Lotus 1-2-3 further out of the market. The Borland/WordPerfect suite will be realigned and probably renamed as the two companies bring out new products and get more in sync with each other.

Borland's Interbase, a server database for the masses, is being positioned as an upsizing path for Paradox and dBase applications that wake up one morning and find they have become mission critical. My guess is that there are many more candidates for such upsizing treatment than anyone could imagine, but Borland has been hard-pressed to actually find them and get customers to start treating them as the information assets they are. But Interbase runs pretty well right out of the box, without the time-consuming tuning other databases require, and is a natural extension of the desktop databases.

Publish-and-subscribe is the model for Borland's Object Exchange (Obex) work-group strategy. Basically, Obex allows a report, the results of a database query or other information to be published across LANs or wide-area networks. Thanks to version control, users can look at both current and historical data. How this works, and what its ramifications are in a market dominated by Lotus' Notes, are too lengthy to explore here.

Nevertheless, Obex represents a core technology that Borland will use to drive both new features and entire new applications.

## Branching out

Client/server tools are a natural extension of Borland's language and database business, but it's not clear how the company will attack this market. The key is that customers are moving toward higher-level (read: "smarter") tools, and Borland has to be there to provide them. The success of the Powersofts of the world is a model Borland can be expected to follow in building easier-to-use client/server tools.

I hope you don't think I'm another of those contrarians — telling you things you know aren't true just for the sake of starting an argument. I can't promise Borland is going to turn things around. I'm just telling you not to be surprised when it happens.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCIMail address is 558-4460.

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# Systems development simplified with CD-ROM

By Thomas Hoffman

Project planners are discovering they can speed up systems development schemes, which are often painfully slow procedures, by replacing scores of hard-bound manuals with on-line documentation. The on-line access lets them more easily ferret out project procedures and resource requirements.

Late last year, a Big Six accounting firm, for example, moved dozens of procedural manuals to a PC-based CD-ROM package so its consultants could generate project plans faster.

In fact, the benefits of the electronic methodologies persuaded the firm, Deloitte & Touche, to market the package to its customers last month.

Deloitte & Touche, based in Wilton, Conn., created a Windows-based CD-ROM version of its 4Front Systems Development Approach, a comprehensive set of systems development procedures, software tools and support, for its Information Technology Consulting practice.

The package, called the Electronic Performance Support System (EPSS), contains a set of 400 reusable templates that provide company consultants with on-line systems development procedures.

Deloitte & Touche consultants said the templates have helped them transfer procedures to future projects by enabling them to download the information to compatible project management software packages, such as Applied Business Technology Corp.'s Project Workbench.

## Time reduction

In December, the CD-ROM package enabled the consultants to develop a project plan to re-engineer and redesign back-office systems for a large health maintenance organization in one week. According to one Deloitte & Touche consultant, it would have taken three months to create that plan manually.

"What we usually do is work over weekends to search through manuals for proper procedures, time estimates and resource requirements before we do the number crunching" for project plans, said Steven Hollinshead, a senior manager at the consultancy.

The on-line methodologies have also appealed to at least one customer. The Los Angeles Metropolitan Water District is eight months into a three-year project to migrate its legacy business applications from an IBM ES/9000 mainframe to a Pyramid Technology Corp. Unix envi-

ronment. That project was designed to provide the utility's end users with expanded access to financial information.

Since the project began last June, the utility has manually applied Deloitte & Touche's project methodology to the downsizing effort. However, the utility's recent implementation of the CD-ROM package — combined with its use of Ap-

plied Business Technology's Project Workbench and Project Bridge software — is expected to expedite the utility's design efforts, according to Elliott Bean, manager of quality assurance and testing for Southern California's largest water supplier.

"We considered developing our own life cycle [methodology], but we rejected

it due to the cost and time to document it properly," Bean said.

He said the agency had considered a desktop-ready methodology from another Big Six firm but opted for the Deloitte & Touche package because the competing package could not be easily modified like EPSS.

"If some technology comes down the pike in two years that's useful, we can integrate that into this package rather than junk what we have," Bean said.



**Elliott Bean:** CD-ROM is expected to expedite design efforts as the L.A. Metropolitan Water District downsizes to a Unix environment.

# Tear down

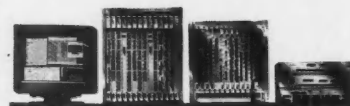
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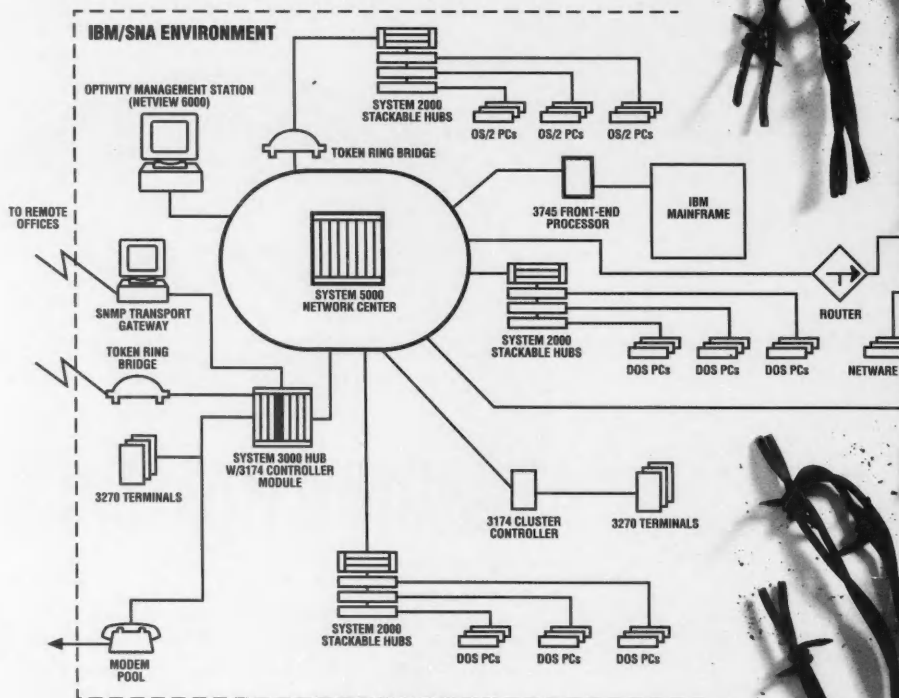
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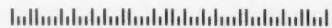
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## Desktop Computing

### Laser trends

CONTINUED FROM PAGE 37

come out with a Windows printer during the next year.

Another factor spurring price erosion is competition from laser printers' lower-end brethren: ink-jet printers. "Ink jets are driving hard on price, and print quality has improved so much that laser sales

are coming under stress because the price disparity is so high," Meiser said.

With an average price of about \$200, monochrome ink-jet printers have gained rapidly on dot matrix printers and are starting to encroach on laser territory. With color-capable ink-jet printers appearing for \$300 to \$400, laser vendors are beginning to feel the heat.

For example, laser prices dropped to sub-\$1,000 levels for the first time early last year and are now starting to hit the

street for under \$500. They are expected to drop below \$400 by the end of the year.

However, both analysts and vendors do not expect price points to drop much further, and with color ink-jet printer prices expected to drop as low as \$200 by 1997, the heat is still on. The most affordable color laser printers are priced at about \$10,000.

While ink-jet printers enjoy a price and color advantage, lasers are kings of the speed and quality hills, although the lat-

ter gap is closing rapidly.

The fastest color ink-jet printers produce only 2 to 3 page/min., while the average low-end black-and-white laser printer can churn out 6 to 8 page/min. for about the same \$400 price tag. Users must therefore decide which is more important — speed or color?

#### Making the logical choice

For some users it is a simple choice. "Our users demanded color, and ink jets represented the most affordable way to meet that demand," said Randy Shaw, senior end-user analyst at The Federal Reserve Bank of Baltimore. "They needed to produce presentation-quality graphics and were willing to take the extra minute or two hit in speed," Shaw said.

Others remain loyal to laser printers.

"We're sticking with laser printers because we don't think the quality of ink jets is quite there yet," said a network manager at a bank in the Midwest, who asked not to be identified.

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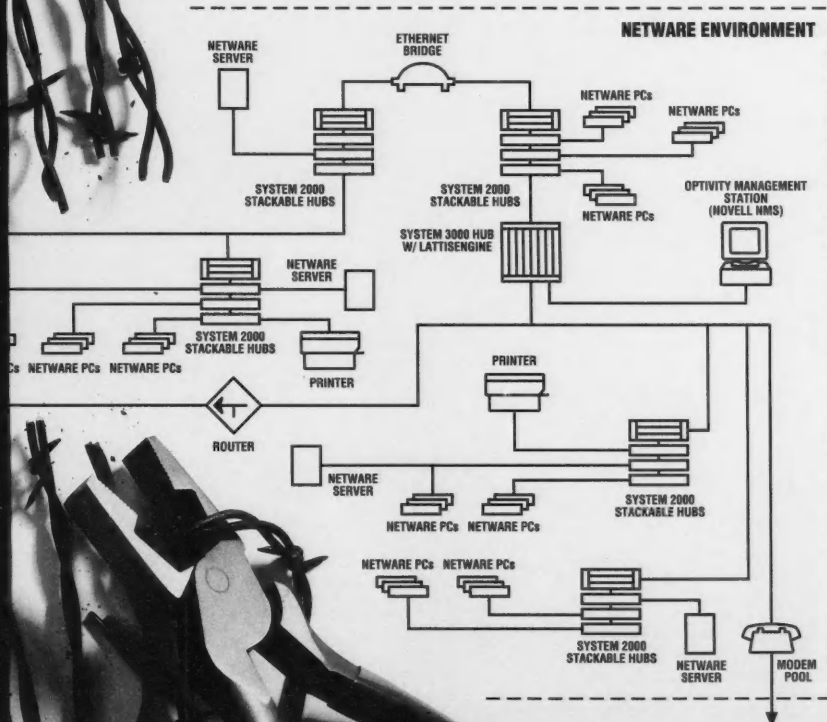
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### Briefs

#### Upgrade expansion

Apple Computer, Inc. has expanded the number of Macintosh models that will be offered a PowerPC upgrade path. The models include the LC 475, 520, 550 and 575; Quadra 605; and Performa 475/76 and 550. Fourteen other models can upgrade to the chip when it debuts in Macintoshes later this month.

#### Health care plan on-line

Technology is lending a helping hand with health care reform. IBM is offering a set of electronic books on disk that will let people browse through the Clinton administration's 4,000-page Health Security Act and Report to the American People. The disks, called the Health Care Reform Bookshelf, are priced at \$99.

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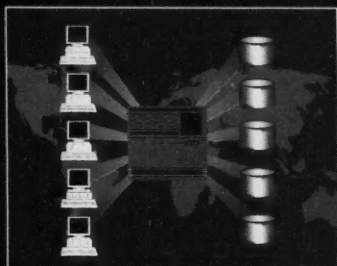
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T o W o r k

d i g i t a l



## Desktop Computing

### Software

**Computer Associates International, Inc.** has announced CA-Simply Accounting 4.0 for DOS, an accounting package that features bank account reconciliation, entries for onetime sales and purchases and simple backup of accounting data.

According to the Islandia, N.Y., company, users can record cash sales in a single transaction in the Sales Journal without having to open the Receipts Journal. A new Integrity feature checks completeness and accuracy of ledger and journal entries for greater data security.

The package also includes a Data Backup feature for easy duplication of accounting data.

The product requires an IBM PC or compatible, 640K bytes of available RAM, DOS 3.0 or higher and a hard disk drive.

CA-Simply Accounting 4.0 costs \$89.

► **Computer Associates International**  
(516) 342-5224

**IMRS, Inc.** has introduced IMRS Forms, a Windows-based product that controls a range of data collection and forms management functions.

According to the Stamford, Conn., company, IMRS Forms supports financial workflow by accelerating and securing data collection and transfer procedures.

Users can design custom forms for detailed data entry with features such as selection list boxes and field-level help, then validate and "lock" information.

Data can be transferred into IMRS Forms from any corporate database, including marketing, manufacturing and sales.

Headquarters site licenses for IMRS Forms cost \$60,000.

► **IMRS**  
(203) 321-3500

**End if Software** has introduced Bottom-Line 2.1 for Windows, a series of cash-flow planning and forecasting tools.

According to the Yuba City, Calif., company, the product imports data from the user's Microsoft Corp. Excel worksheets and compiles it in its own databases. It can calculate cash status reports in weekly, quarterly or yearly increments.

Users can edit or input information directly to the accounts receivable and accounts payable databases through screen entry functions.

Bottom-Line 2.1 for Windows costs \$199.

► **End if Software**  
(916) 671-6700

**Prentice Hall Professional Software** has introduced Version 1.01 of Business Ties, a suite of integrated accounting products.

According to the Atlanta company, the product includes general ledger, payroll, accounts payable, accounts receivable, order entry, job cost and inventory control modules.

Business Ties is integrated with Prentice Hall's product lines for trial balance work papers, client write-up and tax preparation.

Business Ties requires an IBM PC, PS/2 or compatible with 640K bytes of memory, a 5 $\frac{1}{4}$ -in. or 3 $\frac{1}{2}$ -in. disk drive, a hard drive, MS-DOS Version 3.1 or higher, a monochrome or color monitor and an 80-column printer.

Business Ties costs \$395 per module.

► **Prentice Hall Professional Software**  
(404) 432-1996

**Micrografx, Inc.** has introduced ABC Flowchart 3.0, a flowcharting tool.

According to the Richardson, Texas, company, the product features expanded shape palettes, including graphics for business processes and organization charts; an automatic alignment tool for graphics within flowcharts; Object Linking and Embedding (OLE) 2.0 implementation that enables users to easily link documents from any OLE-compliant application; and improved connection lines.

ABC Flowchart 3.0 costs \$495.

► **Micrografx**  
(214) 234-1769

### Hardware

**Canon Computer Systems, Inc.** has announced the IX-4015 Color Image Scanner, a small-footprint, 24-bit color flatbed scanner.

According to the Costa Mesa, Calif., company, the product supports Windows and Macintosh platforms and incorporates Light Source Computer, Inc.'s Ofoto Version 2 scanning software program.

The IX-4015 offers true 400 dots-per-inch by 800 lines-per-inch color scanning resolution.

The scanner supports up to 16.7 million colors and virtually all leading imaging and optical character recognition applications.

The Windows version is available for \$1,175, and the Macintosh version costs \$1,169.

► **Canon Computer Systems**  
(714) 438-3000

**Apple Computer, Inc.** has announced the Apple Color StyleWriter Pro, a color ink-jet printer for the Macintosh.

According to the Cupertino, Calif., company, the Color StyleWriter Pro offers print quality of 360 dots per inch.

Users can print color documents in three ColorSync modes: photographic, business graphics or spot color.

The product includes 64 TrueType fonts and allows printer sharing and password protection using ColorShare software.

The Color StyleWriter Pro can be used with any color-capable Macintosh PC with 4M bytes of RAM, a hard disk drive and System 7 or higher.

Color StyleWriter costs \$629.

► **Apple Computer**  
(408) 996-1010

**Micro Express** has introduced the MicroFlex-PCI/Pentium and MicroFlex-VL/Pentium, two Pentium-based local-bus PCs.

According to the Santa Ana, Calif., company, base configurations for both systems include 8M bytes of RAM; 500M-byte integrated drive electronics fast hard disk drive; 256K bytes of RAM cache; high-performance, 14-in. noninterlaced video monitor; 3 $\frac{1}{2}$ -in. and 5 $\frac{1}{4}$ -in. high-density floppy disk drives; 101-type keyboard; DOS 6.2; Windows 3.1; and self-teaching Windows tutorial software.

The proprietary motherboards for the products have eight expansion slots, including five 16-bit slots and either three VL slots or three Peripheral Component Interconnect slots. Up to 128M bytes of RAM are supported on the motherboard. Each system costs \$3,250.

► **Micro Express**  
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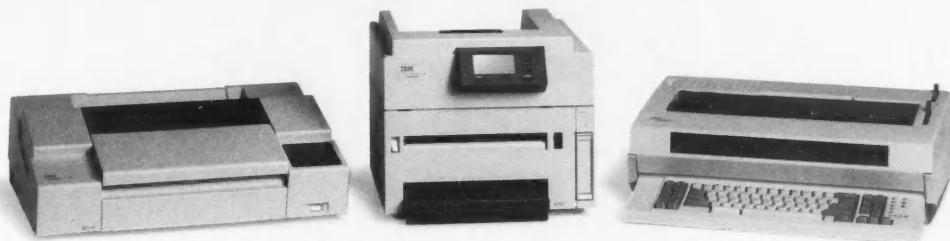
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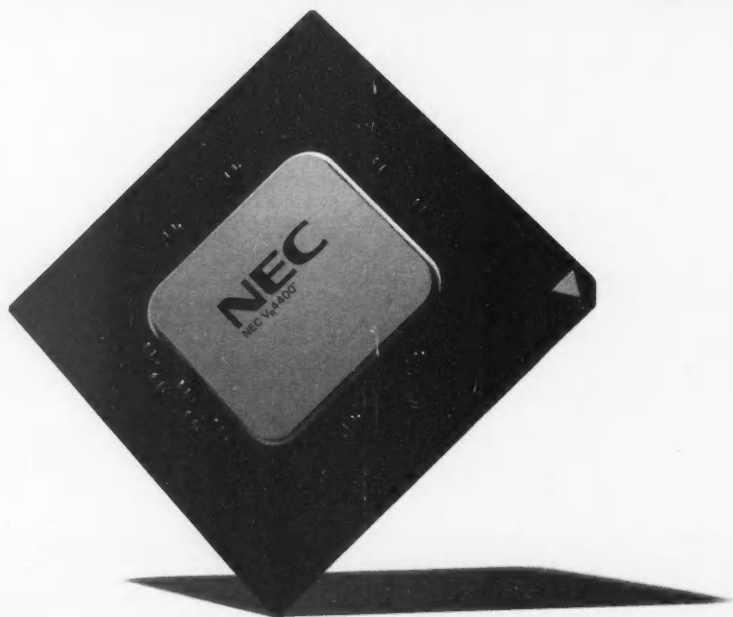
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# Workgroup Computing

## Users gain flexibility with document management

Companies seek savings and better access

By Ellis Booker

Users want to do more with their unstructured data — their “documents” — than merely store them to disk or occasionally print them.

Increasingly, they are turning to document management systems to access repositories of text — and in some cases graphics and images — and to present them in an almost infinite number of ways.

Not only do document management systems provide controls for the creation, distribution and reading of documents, but they are also a more efficient way of handling information because the underlying content is entered or authored only once.

The Douglas Aircraft Division of McDonnell Douglas Corp., for instance, hopes to save \$500,000 a year by doing away with the paper libraries for its technical guides and procedure manuals.

In the next few weeks, Douglas Aircraft will go live with a system from Interleaf, Inc. in Waltham, Mass., that it began piloting last summer.

### Potential expansion

The initial system will involve some 100 PCs connected to three Unix-based servers. It could eventually scale up to Douglas Aircraft's entire 10,000-person work

force, according to Michael Krawski, project manager at the information systems organization.

Such “reusable” text is also a goal of Encyclopaedia Britannica in Chicago. “We want to be able to



push a button and make a new product,” said Phil Rehmer, a systems analyst and staff specialist at the publisher and an attendee at the Documentation '94 conference in Los Angeles two weeks ago.

Analysts agreed that while users have become sophisticated lately with the management and manipulation of structured data through databases, few have yet applied a comparable strategy to vital corporate documents.

“The vast increase in the availability of electronic documents, from E-mail to news feeds, is conspiring to create environments

rich with electronic documents that we can't manage effectively,” said Linda Myers-Tierney, an analyst at International Data Corp. (IDC) in Framingham, Mass., who focuses on document management.

But IDC forecasts considerable growth in the software marketplace for systems that index, store, track, distribute and present electronic documents. IDC predicts the market will grow from \$1.7 billion in 1993 to \$3.7 billion by 1997. (This figure does not include the document imaging marketplace, though Myers-Tierney noted that document management vendors are broadening their support for different data types, including image, voice and video.)

### Growth pains

Meanwhile, the document management industry is a roily mess, with products coming from at least three kinds of companies: imaging/workflow vendors, publishing system vendors and database vendors.

On the positive side, there is a growing consensus on the need for standards, principally the Standard Generalized Markup Language (SGML) (see story at right).

One reason people are interested in SGML is their need to recycle the content of documents as they cross different software applica-

**Documents, page 50**

## Document currency

Sometimes called the *lingua franca* of open systems document management, the Standard Generalized Markup Language (SGML) specifies data encoding of a document's format and content.

SGML has been a standard of the International Standards Organization (ISO) since 1986.

Because SGML separates the content from formatting information, a document can be output in any way needed. An SGML document is recognized by its ability to resize instantly when the viewing window changes proportions.

Recently, many software firms have joined the SGML bandwagon in response to customer pressure. The aerospace and pharmaceutical industries, for instance, moved to adopt SGML under federal regulations.

Significantly, commercial word processing vendors seem to be moving toward SGML, too. WordPerfect Corp. has offered an SGML translator for its DOS and Unix products for about nine months, and a Windows version is due soon. Microsoft Corp. has stated its intention to support the standard with Word. Indeed, the majority of product introductions at Documentation '94 last month in Los Angeles concerned SGML products.

Vendors are using SGML internally, too. For the past year and a half, Silicon Graphics, Inc. (SGI) has put the documentation and help for its Irix Unix operating system on-line using SGML and an SGML “browser” software system from Electronic Book Technologies in Providence, R.I. Novell, Inc. likewise ships the manuals for NetWare 4.0 in SGML format.

“The beauty of SGML is you can tag blocks of text from one source and use them for the printed version, the on-line documentation and the on-line help,” said Bryan Clapper, engineering manager at SGI in Mountain View, Calif.

Several software firms have been meeting to establish an SGML format called a DTD, or document type definition, for exchanging product and technical information among themselves. — Ellis Booker

## PC vendors jockey to fill server market segments

By Michael Fitzgerald

■ Following a strategy they successfully employed on the desktop, vendors are targeting servers at different markets, recent announcements indicate.

For instance, Compaq Computer Corp. will this week introduce ProSignia VS, a version of its midrange ProSignia line aimed at small workgroups. ProSignia VS will use Intel Corp.'s 33-MHz i486SX, 33-MHz i486DX and 33/66-MHz DX2. It is based on the Extended Industry Standard Architecture (EISA) bus. Expected pricing ranges from \$1,730 to \$4,200.

Compaq worked to improve disk I/O on the ProSignia VS line because Novell, Inc. NetWare environments with fewer than 30 users tend to have more bottlenecks in I/O than in processor performance, ac-

cording to Mary McDowell, systems marketing manager at Compaq. McDowell said Compaq expects the VS to be its highest-volume server line this year.

Compaq will also enhance its mainstream ProSignia line, upgrading high-end models to include 16M bytes of RAM, the NetFlex-2 Controller from the high-end ProLiant and the SmartStart server configuration. Compaq's Insight Manager server management tool and full-duplex Ethernet are also now options for the ProSignia and the ProSignia VS.

### Toward the high end

Moving in the other direction, the IBM PC Co. announced a couple of new high-end PS/2 Model 95s last week. Based on Intel's 66-MHz Pentium processor, with 16M bytes of RAM and a 1G-byte hard drive, these servers have a base price of

\$11,735. The servers will use Netfinity management software instead of a scaled-down version of IBM's Mass/2, which runs on its 195 and 295 models, as originally planned.

Meanwhile, Dell Computer Corp. recently began shipping its revamped server line [CW, Jan. 31]. The new PowerEdge SP is a midrange server that starts at \$4,595. Prices for a higher-end server, the PowerEdge XE, will start at \$6,851. The 486-based servers come with 8M bytes of RAM expandable to 128M bytes, while the Pentium-based systems have the same base configuration but can support up to 192M bytes of RAM. The SP supports up to 8G bytes of internal storage; the XE can support double that amount.

Both use EISA buses and the Peripheral Component Interconnect (PCI) bus. Among options for the high end is the

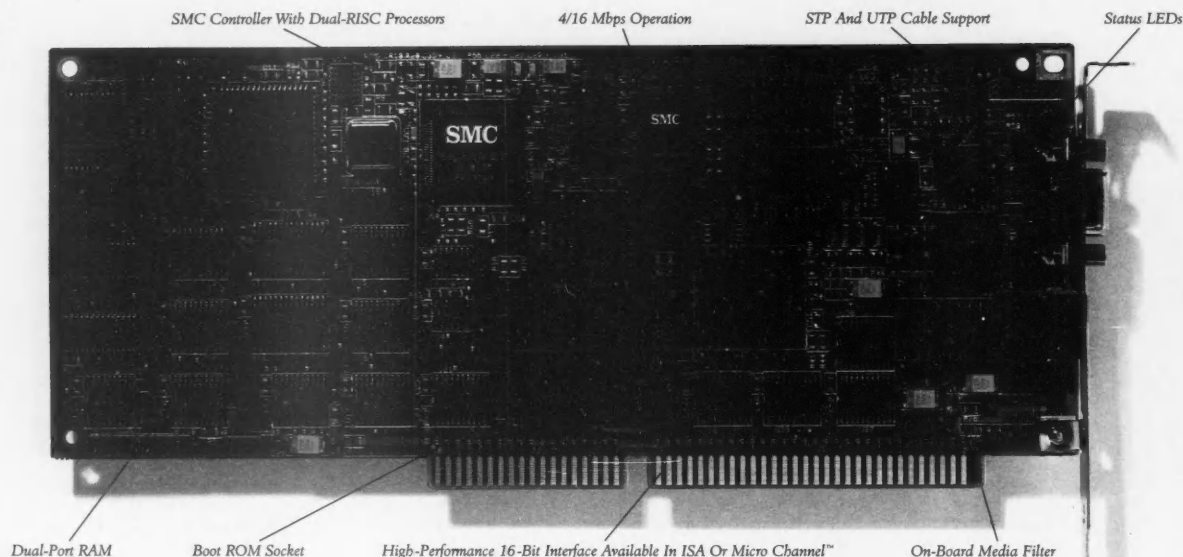
new Dell SCSI Array 3.0, an enhanced version of Dell's disk subsystem. Thermal monitoring is standard on the XE and optional on the SP. Error Correcting Code is an option on both systems.

Dell also announced LANsolve, a program designed to give better customer service for server purchasers. For instance, customers can have an Ethernet card preinstalled at Dell's factory.

“Vendors are trying to diversify by architectures and also beef up their low-end server lines,” said John Dunkle, president of WorkGroup Technologies, Inc., a research firm in Hampton, N.H. Dunkle said that while desktop PCs tipped on their sides worked well for simple peer-to-peer LANs, users' desire for more functions, such as electronic mail and application sharing, were driving the need for expandability.



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## There's a new leader in Token-Ring Technology.

In June 1993, InfoWorld tested the top Token-Ring adapters for speed and flexibility. Guess who came out on top?



Not IBM, Madge or Olicom. But SMC. The review stated: "Not only did the

THE SCORES	
SMC TokenCard Elite	9.4
IBM 16/4 Token Ring Network Adapter II	8.3
Proteon ProNet-4/16 P1392	8.0
Madge Smart 16/4 AT Ringnode	7.8
Olicom ISA 16/4 Token Ring Adapter	7.7
3Com TokenLink III 16/4 ISA	7.7

In a recent comparison in InfoWorld, SMC came in first.

SMC TokenCard Elite™ offer overall excellence (with excellent or very good scores in every category), it stood out for being among the easiest to install."

The SMC TokenCard Elite is 100% interoperable within IBM environments. It's also fully compatible with both IBM and IEEE 802.5 Token-Ring standards, fully software configurable, and backed by a lifetime warranty. You get lots of extras, too. Like free SNMP management.

But the story doesn't end there. SMC is not only the technology leader but also the low price leader.

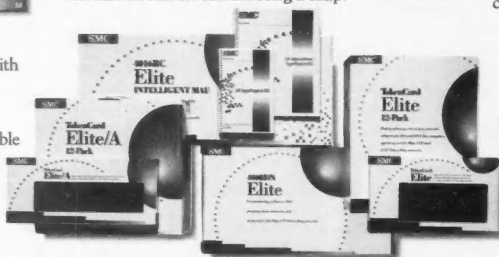
In fact, with an incredible new price of \$249 in a 50-pack, and only \$299 for a single card, the SMC TokenCard Elite is priced far lower than any other Token-Ring adapter.



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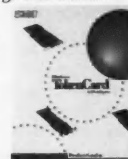


In fact, according to independent network testing laboratory LANQuest Labs, EZStart is "head and shoulders above the others."

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# Workflow tool strikes human chord

Package helps users define projects, needs, costs, work relationships

By Lynda Radosevich

Action Technologies, Inc. said it will ship by the end of this month work process analysis software that aims to help business managers define and improve basic workflows and work relationships.

The Alameda, Calif., company is best known for its business process automation software, which works with Lotus Development Corp.'s Notes or SQL databases. Part of that automation package includes a utility for analyzing and improving how people interact to get work done. Now the company has unbundled that tool to be used alone or in conjunction with the larger package.

Called ActionWorkflow Analyst, the \$495 software tool takes a different approach to organizing work than typical project planning software.

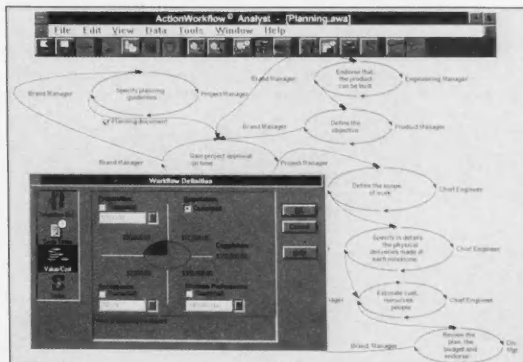
"Project planners tend to focus on deadlines and milestones. This addresses the human elements by looking at what the people need to do, when they need to do it and how they need to work

together," said Ronni Marshak, editor in chief of the Patricia Seybold Group's "Workgroup Computing Report" in Boston.

Like a project manager, the software is meant to enable departmental managers to take a bottom-up approach to organizing work processes, in contrast to the top-down approach that Action's larger workflow system fosters.

## User Input

The software requires users to break down processes into units of work with the help of input screens and define a "performer" and a "customer" for each unit. In addition, users must supply information such as cost and time spent per unit and factor in several human interaction elements such as whether the



ActionWorkflow Analyst, unbundled from a business process automation package, helps individuals act as their own "consultants" when looking at re-engineering their company's systems

work was acceptable.

It then creates a map that illustrates how work gets done, who's involved and so on. It calculates values based on factors such as employees' hourly fees and allows the user to change pieces of the map to model how changes could eliminate unnecessary work. It also checks to see that all necessary fields are filled in and that the time and value allocations are logical.

Unlike large-scale re-engineering systems, the software is meant to help improve processes at a more local level. It is different from software re-engineering tools that look at technology and not people's interdependencies. It can be compared to a human consultant, but "it's a lower cost and lower investment way to start rethinking your processes, start seeing how they interrelate and looking at the dependencies," Marshak said.

## Heart of the matter

Action Technologies sold Message Handling Service (MHS) technology to Novell, Inc. in 1991. MHS is the transport mechanism at the heart of Novell's messaging strategy.

## Briefs

### CA server delivery

Computer Associates International, Inc. last week began beta delivery for OS/2 LAN Servers of CA-Unicenter, the firm's distributed systems management package.

In other news, CA announced plans to ship its forthcoming CA-Unicenter for Microsoft Corp.'s Windows NT systems management package on NetPower, Inc.'s IPS R4400 RISC-based servers running Windows NT. Under the terms of the agreement, NetPower will distribute a demonstration version of CA-Unicenter for Windows NT during a special promotion period and CA will provide NetPower customers with a free 120-day license.

### ASK upgrades Manman

The ASK Group, Inc. has announced an upgrade to its Manman/X line of Unix-based manufacturing and financial applications. Manman/X 3.0 includes features such as supplier scheduling for organizing the receipt and distribution of manufacturing materials and billing, and enhancements to field service order processing. The packages are due to ship in April, with prices ranging from \$250,000 to \$300,000 for a 128-user system.

### Xyplex enhances servers

Xyplex, Inc. said it will incorporate Stampede Technologies, Inc.'s Re-

mote Office Client Software into its access server product line. According to Xyplex, this will provide remote Novell, Inc. IPX users with the ability to access the enterprise network with all the same rights and privileges as nodes attached directly to the corporate LAN. The software will be available to Xyplex users at midyear. It will cost \$50.

### SCO Unix supports Sybase

The Santa Cruz Operation said it will announce this week that its SCO Unix operating system now supports Sybase, Inc.'s System 10 relational database management system.

### CNE status for UnixWare

Novell, Inc. last week announced it will expand its Certified NetWare Engineer program to include an elective UnixWare track. Novell said customers will be better able to identify engineers carrying UnixWare expertise.

### Face-to-face agreement

Adobe Systems, Inc. and Crosswise Corp. announced a joint marketing, development and investment agreement. Under the terms of the deal Adobe will repackage Crosswise's Face to Face document conferencing product.

### Xircom adapter available

Xircom, Inc. said its Credit Card Token Ring Adapter is now available in volume.

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# Microsoft muscles into hospitals

## Windows NT's speed, ease of installation impress industry skeptics

By Mitch Betts  
PHOENIX

In the health care industry, the conventional wisdom is that Unix is the operating system of the future. But Microsoft Corp.'s Windows NT is beginning to make inroads by winning over some previously skeptical information systems managers.

Larry Blevins, chief information officer at the Harris Methodist Health System in Fort Worth, Texas, is a prime example. He seriously considered IBM's AIX, a Unix variant, and OS/2 before settling on Windows NT Advanced Server for an \$8 million client/server system that handles patient tracking.

The managed-care system, which went live in November, involves 400 Windows 3.1 clients and Windows NT Advanced Server running on two Compaq Computer Corp. ProLiant 2000 super-servers. Blevins said there have been no problems with the system, and he eventually plans to convert all 45 of the company's servers to the Windows NT Advanced Server.

There is no doubt that the system is truly mission-critical; it is used for auto-

matic billing, tracking the demographics of patients, physician profiling and analyzing profitability. The health conglomerate, with \$750 million in revenue, in-

cludes 10 hospitals, the seventh-largest health maintenance organization in the U.S. and numerous other companies. Why take the NT plunge? Blevins cited many reasons, including ease of installation and the fact that IBM was unable to deliver its promised system. But perhaps the biggest reason was that rigorous benchmarking tests showed that the Compaq/Microsoft system was "four to five times faster and half the cost" of IBM's proposal, Blevins said.

Furthermore, Blevins said he was "amazed" that Microsoft brought in a team of experts to install, convert and test the system, all within 10 business days.

"A year ago, I would have said that Microsoft's chances in the health care market were limited. But now I have real experience [with

them], and I'm confident they will be a major player," Blevins said.

That sentiment was echoed by Wayne Searls, vice president of administration at Rochester General Hospital in Rochester, N.Y., who said his staff easily installed Windows NT Advanced Server on three servers in the course of a week. As Windows NT matures, it will be a major player alongside Unix, he said.

Microsoft still has an uphill climb in the health care market, where Unix is the dominant player because it is perceived as the path to open systems. But for the first time, Microsoft is actively pursuing this vertical market and made its debut at the Healthcare Information and Man-

agement Systems Society's show last month in Phoenix.

Is the operating systems war any different in the health care industry? Industry observers said the only differences are that the industry is coming late to war — after hanging on to legacy systems longer than most — and OS/2 is not a major player.

Microsoft has a chance to be one of the major players in health care if it aligns itself with the right application developers, said Jerry Mathys, executive vice president at Sheldon I. Dorenfest Associates Ltd., a Chicago consulting firm that specializes in health care IS.

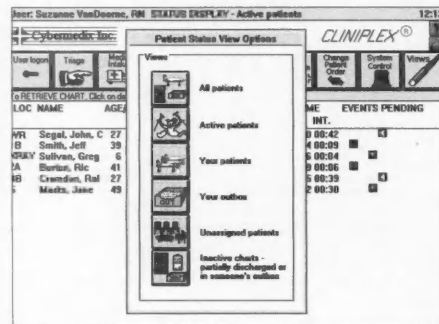
"The winner of the next-generation health care systems market has not been identified and may not be one of today's big players. It's early in the race, and the horses are just out of the gate," Mathys said.

### Opportunities taken

Dave Chase, manager of health care industry marketing at Microsoft, said Microsoft is working with more than 100 software developers who specialize in health care applications. Among the new products based on Windows NT are a medical records system from Win2 Technologies, Inc. in Loma Linda, Calif., and an emergency room system from Cybermedix, Inc. in Vienna, Va.

In addition to emerging developers, Microsoft is working with industry veterans such as Shared Medical Systems Corp. in Malvern, Pa., to ensure that their next-generation software products can run on Windows NT. Microsoft is also pushing its Visual Basic, SQL Server and Office suite as tools for the health care industry.

Further demonstrating a commitment to this vertical market, Chase said Microsoft will be joining Health Level 7, an Ann Arbor, Mich., standards organization.



Cybermedix's expert system for emergency rooms runs on Microsoft's Windows NT

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## Documents

CONTINUED FROM PAGE 47

tions and hardware platforms, said Frank Gilbane, editor of "The Gilbane Report," a newsletter from Publishing Technology Management, Inc. in Arlington, Mass.

In addition, object-oriented programming is making an important contribution to document management, Gilbane said.

"Object-oriented approaches are much more suited" to the problem of documents, he said, because they can represent both the document's content and its structure (formats for characters, blocks of text and so forth).

Meanwhile, Dennis Andrews, president of Xerox Corp.'s Xsoft division in Palo Alto, Calif., pointed out that as documents become more complex and begin to incorporate different data types and real-time data, they cease to be "intuitively" understandable. For this reason, Andrews said, more work is still needed on the browser, or user interface, side of the document management equation.

Genesys Software Systems, Inc. has introduced Client/Server HRMS Version 5.0, a human resource management system (HRMS).

According to the Methuen, Mass., company, the product employs technologies that include Dynamic Data Exchange, Object Linking and Embedding, voice response, imaging and a windows graphical user interface.

Version 5.0 allows for the separation of application logic to an application-specific server, in addition to distributed clients and database server support.

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Security Watch

James Daly

## Breaking and entering



**Hack Attack.**... Civil disobedience used to be so easy. Time was when you could carry placards and chant catchy slogans in front of a local corporate polluter or dump cow's blood on the files of some greedy arms merchant, and you were in business.

No longer. If you want to make a Fortune 500 nuisance of yourself these days you practically need a degree in electronics engineering to muck around on the computer system where the really good dirt is.

Until now, that is. *Secrets of a Super Hacker* is a nifty little book by a mysterious writer called The Knightmare who claims to reveal all the tricks necessary to illegally enter and then run barefoot through the computer systems of your choice. Panicked? Well, that's the point.

The Knightmare says he wrote the book to illustrate the ridiculous deficiencies in many computer systems. While hardly a public servant, he has a point. Most image-conscious companies are lax about revealing potential security gaps in their products. The breaches are well-known and exploited by the computer underground while rightful owners remain blissfully unaware of these flaws. Sort of like if Ford's tires flew off at speeds greater than 60 mph and they forgot to tell you. The Knightmare figures that if people are shown the holes, they can learn to protect themselves.

Perhaps what is so alarming is the relative ease with which these break-ins can occur: dim-witted employees who actually give out secret passwords; confidential log-ons written on manuals that are later donated to libraries; or hackers simply going through company trash to discover confidential memos. *Secrets of a Super Hacker* costs \$19.95 and is available from publisher Loompanics Unlimited in Port Townsend, Wash. It should be read by anyone who has the crazy notion that his data is safe.

**Let's make it official.**... What do the following people have in common: systems software specialist, internal auditor, chief of data management, head of software development, chief of communications management, network administrator and systems analyst?

Answer: They are all in charge of computer security. The jumble of titles highlights the fact that data security is often considered a secondary job, an ancillary responsibility.

This confusion has led to efforts to standardize the field by pushing for a specialized professional certification. The first thing to do, though, is decide what exactly this beast called an information security employee is and does

Daly, page 54

## Mail users face quandary

By Lynda Radosevich

■ Users thinking about moving off their host-based electronic-mail systems are being deluged with vendor-speak about upcoming "client/server" systems vs. today's PC LAN file-sharing architectures. Both have pros and cons that customers would do well to understand before making a choice.

In a nutshell, the difference between file-sharing and client/server systems is where the bulk of the processing is done. In client/server architectures, the processing load is shared equally between the client and server; in file-sharing architectures, the client does all the processing.

Most major LAN E-mail systems today use file-sharing architectures. Among other tasks, the client creates and reads messages, moves messages from one location to another and looks up directory information. The server simply holds the shared file, or post office, in which the messages are stored.

The client communicates with the server via the network file system's protocol. Typically, separate machines handle "gateway" functions that translate messages between different systems, according to David Marshak, a vice president at the Patricia Seybold Group, a consultancy in Boston.

But while this method works well for LANs with fewer than 200 users, there is a practical limit to how many users a server can support.

For instance, in Lotus Development Corp.'s CC:Mail, users often have to clean up and reorganize the message store file, and "the more users, the longer it takes to do database maintenance," said Steve Dickson, a message network

### Two kinds of LAN messaging

#### FILE-SHARING ARCHITECTURE

##### PROS

- Simplicity
- No need for a separate application server

##### CONS

- Security and scalability problems
- Processing load can slow client performance

#### CLIENT/SERVER ARCHITECTURE

##### PROS

- Better performance and scalability
- Can process workflow and filters without the client software running
- Server retains statistics for management reporting

##### CONS

- More complex
- Servers must be available to run tasks
- Generally requires a multi-tasking operating system such as Unix, OS/2 or Windows NT

Source: Patricia Seybold Group, Boston

manager at US West Technology in Denver.

Another problem with the file-sharing architecture is that it can pose security problems. Today, when a user sends a Microsoft Corp. Mail message, the client software writes the message into the recipient's in-box. Because the in-box is on the file server, the security is only as good as the security on the file server. "By definition, there is a shared directory, so there is always some way for someone who is sufficiently clever to delete files," said Bill Sornsin, a messaging product manager at Microsoft.

In client/server messaging architectures, the processing is more equally divided between the client and server software.

Messaging, page 54

### Multimedia applications

## United rewires support facility

By Ellis Booker

United Airlines' \$1 billion maintenance center in Indianapolis will open for business this month, carrying the promise of being ready for future technologies.

The 3 million-sq-ft facility, on 270 acres at the Indianapolis Airport, will sport 11 hangars and be the home of some 8,000 technicians and support personnel when completed in 2003.

The next-generation maintenance depot will also sport a broadband telecommunications infrastructure to support voice, data and video traffic.

For example, every workstation or data jack at the Indianapolis center will have a composite cable containing a Category 5 unshielded twisted-pair, a Category 3 unshielded twisted-pair and two multimode fiber-optic cables, plus cables for peripherals such as printers and bar-code readers.

### No rewiring required

"When we're finished in 2003, there will be approximately 8,000 of these multimedia wall plates," said Kevin Manweiler, senior telecommunications engineer responsible for voice communications and infrastructure design at United. "The benefit is, you never having to pull another cable or add conduits."

Manweiler's colleague Bob Hasty, a senior staff engineer



United Airlines' facility will sport 11 hangars when completed in 2003

in United's MIS group and MIS project manager at the Indianapolis facility, agreed. "The last thing we wanted was to rewire existing hangars a couple of years later," he said.

Hasty noted that the broadband networks will support planned client/server-based applications. Those applications, the first of which will be piloted by the end of the year, will include on-line access to schematics and diagrams. To start, however, the workstations in the hangars will simply run terminal emulation to reach legacy mainframe and minicomputer systems.

Anticipating the need for multimedia applications in the future was a chief reason why the Indianapolis center will use fiber-optic instead of copper cabling wherever possible.

The 2.2-mile-long network backbone is a Fiber Distributed Data Interface ring. It will connect 38 LAN hubs with primary and backup data/telecommunications centers.

## Daly

CONTINUED FROM PAGE 53

and how the certificate should be obtained.

Well, we're closing in on that goal. Thus far, the National Institute for Standards and Technology and the National Computer Security Center have developed "A Unified Taxonomy for Infosec Professionals," a nasty-sounding document that codifies the knowledge and skill needed to be a competent network cop. It also serves as a yardstick for job classification as well as a guide to career and professional development activities.

Last week, a meeting of the Federal Information Systems Security Educators Association in Gaithersburg, Md., brought the description into sharper focus, and another meeting at Idaho State University in April is expected to result in a working "Unified Common Body of Knowledge." That would be your certificate outline.

Despite good intentions, some users remain skeptical of the need for professional accreditation.

"I know a lot of people who can't take a test worth a darn but are the best folks to have in the trenches when you're fighting a security problem," said Dennis Evans, a systems analyst at the Illinois De-

partment of Revenue in Springfield.

In a field as dynamic as information security, any professional certificate must also come with an important caveat. The accreditation, when it is ultimately available, will be a measure of knowledge, not a quantifier for the ability to apply it. It will be a starting point, not a Superman designation.

**Quote of the month.** . . . Internet users are shoring themselves against the latest in an increasingly regular series of attacks on the networked community. In recent years, as the Internet has changed from the home of the academic and research communities to an electronic playground that by some estimates is growing by a million users per month, attacks such as the recent one in which password files were stolen have increased.

Many newcomers are blissfully unaware of the myriad ways in which their data may be compromised by Internet-borne mischief.

Padgett Peterson, a security manager at Martin Marietta Electronics in Orlando, Fla., said, "Five years ago the Internet was like a jungle being explored by the research and academic community. Now we have the tourists with their Bermuda shorts coming in and getting themselves in trouble."

Daly is a San Francisco-based writer.

## Wellfleet cranks up routers

New feature alerts users to high traffic levels in the network

By Elisabeth Horwitt

■ **Wellfleet Communications, Inc. recently announced enhancements to its routers' SNMP-based management capabilities, particularly in the areas of security and performance.**

The enhancements target an increasingly common user problem: Simple Network Management Protocol (SNMP)-based management systems can flood the wide-area network with polling requests for information from managed devices throughout the enterprise.

A new feature, SNMP Statistics Thresholds, lets users get around that problem by programming a router to alert the management system when a threshold is crossed, such as when traffic levels exceed a certain number. Up to three thresholds per router can be programmed.

A second feature, SNMP Trap Enhancements, allows the user to set up filters that screen messages sent to the management station. For example, a router could be programmed to send only those messages that reach a certain severity class, or to forward events regarding TCP/IP but not Novell, Inc.'s IPX transport protocol.

Wellfleet also announced a security system

in which encrypted counters are exchanged to synchronize manager/agent interaction and guard against unauthorized users gaining managers' rights to the network.

Wellfleet plans to further enhance its router management capabilities with the support of SNMP Version 2 by the second half of next year, said Alan Rosenberg, the company's network management products manager.

SNMP 2 offers security and enables a management station to collect larger pieces of information at one time.

**Data collector**

Wellfleet may also implement SNMP 2's midlevel management information base, which allows an intelligent system—such as a hub or a router—to act as a local collection point for attached devices and

send only critical information to the central manager.

However, given the current lack of commercial support for SNMP 2, the Billerica, Mass., router vendor is meeting its users' immediate needs with proprietary features such as Statistics Thresholds and Trap Enhancements, which are available immediately.

However, because they are not standards-based, the features will not work with SNMP-based management platforms such as Hewlett-Packard Co.'s OpenView.

Simple Network Management Protocol 2 offers security and enables a management station to collect larger pieces of information at one time.

## Messaging

CONTINUED FROM PAGE 53

ware. The client software typically creates and reads messages. The servers move messages from location to location, match users' "nicknames" to actual names in the directory and run the gateways. Clients and servers communicate via Remote Procedure Calls (RPC), Marshak said.

An RPC is an interface that allows one program to call another in a remote location. The RPC method used in client/server architectures is more secure than that used in file-sharing messaging because the client software does not have to open and access a shared database file. Rather, the server sends information out to the client via an RPC. The server database is never really "open" to the clients, like it is in file-sharing.

Also, that means servers can support more users. Again, that is because multiple clients are not constantly opening and closing the message database. This repetition can create performance problems as more users are added, according to analysts.

For example, CC:Mail file-sharing servers support a maximum of

**Pack leader**

While E-mail LAN vendors rush to develop client/server products, Hewlett-Packard Co. already offers one: HP OpenMail, an X.400 and X.500 standards-based messaging system with transport, directory and message store services that work with CC:Mail, Microsoft's Mail and a variety of HP desktop clients. Although the product has a limited installed base, it is making headway in some larger firms. HP announced recently that Amoco Production Co. chose OpenMail as the basis for its enterprise electronic messaging system. Amoco will move 14,000 IBM Professional Office System users to OpenMail by year's end, a spokesman said.

250 users for optimal performance, according to Larry Crume, Lotus' vice president of electronic messaging and mobile computing. In contrast, the company's upcoming Lotus Communication Server, a client/server messaging system based on Notes, should serve approximately 1,000 users, assuming it runs on superserver hardware such as an IBM RS/6000, he said.

Another benefit of client/server messaging is that it should offer a more seamless set of gateways because gateway routing functions can be off-loaded to the server.

"Now an end user has to know how to route a message," said Mark Tebbe, president of Lante Corp., a consultancy in Chicago. With gateway functions residing on an intelligent server, users should not see the routing data in their client software, he said.

But while client/server sounds good, the technology is fairly new to LAN messaging. And new servers from E-mail market leaders Lotus, Microsoft and WordPerfect Corp. are not likely to become widely available until 1995.

However, when the servers do arrive, they will be fully compatible with file-sharing products so customers can migrate incrementally, all three vendors said.

## Ups and downs of client/server messaging

Both file-sharing and client/server E-mail architectures have their fans. For Gary Wilkerson, supervisor of end-user services at Kaiser Foundation Health Plan of Georgia, Inc. in Atlanta, client/server messaging will be the basis of applications that move far beyond simple person-to-person E-mail.

For instance, a message could be automatically generated by an application based on triggers, rather than by a person, he said.

Meanwhile, at least one major E-mail user is not thrilled with client/server messaging.

Steve Dickson, a message network manager at US West Technology, said he has reservations about the additional work needed to maintain client/server RPC technology.

"An RPC does not ride on top of the existing file service, so it is a whole new level of support," he said. "Using RPCs, manag-

ers need a completely different set of diagnostic tools to see whether users can get their E-mail."

For its part, Kaiser is going ahead with installing WordPerfect Office for 1,200 users, a project Wilkerson expects should be complete by April 30.

By this summer, Kaiser plans to use E-mail to automatically move clinical information among medical offices.

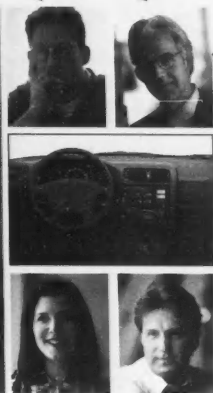
For instance, when laboratory results stored in a Sybase, Inc. database exceed key ranges specified by physicians, the database will automatically send the physician a high-priority E-mail message warning him that the data is out of range.

More powerful messaging servers will be important for developing the recording, tracking and security applications needed for such a critical application, Wilkerson said.

—Lynda Radosevich



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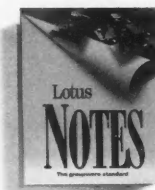


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To aggressively meet the challenges of competing in a "Unified Europe," General Motors Europe has streamlined, with the help of EDS, a Lotus Notes Business Partner. Central to this new structure is Lotus Notes, the vanguard of a new category of software called groupware.

## GENERAL MOTORS USES NOTES TO UNIFY EUROPE. HOW BIG IS YOUR PROBLEM?

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### Briefs

#### Internet goes to Washington

Rep. Sam Coppersmith (D-Ariz.) has become the first Capitol Hill lawmaker to establish a two-way system for constituents to get information and send messages to his office electronically. Coppersmith's Internet bulletin board includes resources for small businesses and in-

formation on how companies can take advantage of the North American Free Trade Agreement. The Internet address is [smaz01@hr.house.gov](mailto:smaz01@hr.house.gov).

#### Banks join remote service

Comerica Bank and First Interstate Bank of Denver have signed on to MasterCard International's MasterBanking remote banking and electronic bill-payment service. They join Chemical Banking Corp., Signet Bank, Capital

Bank and Space Coast Credit Union in the MasterBanking service.

#### Companies enhance routers

CrossComm Corp. and ProTools, Inc., a wholly owned subsidiary of Network General Corp., will implement what is said to be the first Remote Network Monitoring (Rmon) capability on a router. CrossComm's ILANXL routers will be able to act as Rmon agents, reporting traffic and protocol statistics to Simple

Network Management Protocol managers. Availability is scheduled for the second quarter.

#### Ameritech opens up

Ameritech Corp. has submitted tariffs to the Illinois Commerce Commission specifying how it will open its local network facilities to competing local carriers in the areas it serves.

#### Compaq lends support

Compaq Computer Corp. recently announced that customers can access its Online Support technical support services via Prodigy's interactive computer network.

#### Health care system gets wired

The Prudential Health Care System's Southern Group Operations in Atlanta is planning to integrate AT&T's InterSpan frame-relay and Asynchronous Transfer Mode service into its southeastern U.S. network by late 1994. The network, which will be designed for Prudential-affiliated physicians to share video, voice and data, will include AT&T StarLAN and StarWAN networking hardware and AT&T SmartHUB XE hubs.

#### Digital provides Nynex server

Digital Equipment Corp. will supply the processor portion for Nynex Corp.'s video and interactive server deployment in Rhode Island. The broadband server technology will use Digital's Alpha AXP processors as well as its disk, tape and high-speed networking equipment.

#### China gains networked news

Ascom Timeplex in Woodcliff Lake, N.J., will provide a 32-node satellite-based network to China's national Xinhua News Agency. The system, which will support voice, data, image and video, will be China's first national, private network to be linked by satellite, according to the vendor.

#### Cascade supports frame relay

Cascade Communications Corp. in Westford, Mass., has become the first hardware vendor to announce support for Frame Relay Switched Virtual Circuits (SVC). The SVC standard for frame-relay networks, issued earlier this year at the ComNet show by the Frame Relay Forum, supports variable bandwidth virtual connections. Cascade's SVCs will be an optional software feature available in the spring and cost between \$5,000 and \$10,000, depending on the Cascade switch platform.

Creating those new client and server applications would be far more rewarding if you could reuse existing code instead of rewriting it. And now that goal becomes reality with object-oriented programming. Especially when you can rely on VisualWorks™, the ParcPlace Smalltalk™ Applications Development Environment that creates applications that are instantly portable between Windows, OS/2, Macintosh and UNIX. True OOP, it provides a robust set of tools to build sophisticated graphical applications with access to a wide variety of relational databases. Fully armed with superior flexibility, dynamic compilation for impressive performance and the world's largest set of tried and tested class libraries, VisualWorks is scalable from enterprise to department and back. Call 1-800-759-7272 ext. 400 for our Solution Pack. You'll see why so many forward-looking Fortune 1000 companies have selected VisualWorks for client and server development. And stopped rewriting history.

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## Enterprise Networking

**Apertus Technologies, Inc.** has announced Datastar/Universal Access, a TCP/IP-to-SNA gateway designed to provide thousands of TCP/IP clients with transparent access to IBM SNA and Bi-Sync host resources (legacy applications and data) through a single virtual gateway complex.

According to the Eden Prairie, Minn., company, the product works in conjunction with Datastar/DataCenter Hubs to provide load balancing for balancing traffic among gateways, fault tolerance and scalability in LAN-to-host communications, which gives corporate LAN and wide-area network environments the flexibility to add client and host systems.

Pricing begins at \$8,995.

► **Apertus Technologies**  
(612) 828-0300

**Fibermux Corp.** has announced SnapLAN, a five-module "snappable" hub system for Ethernet and Token Ring networks.

According to the Chatsworth, Calif., company, SnapLAN employs a coupling design that simplifies installation by eliminating bus cables.

The product offers managed connectivity for four to 56 users and a multiprotocol wide-area network router module from Wellfleet Communications, Inc.

Modules include the Ethernet Hub Module, Ethernet Management Module, Token Ring Hub Module, Token Ring Management Module and Wellfleet Router Module.

Managed Ethernet systems range in price from \$90 to \$174 per port; managed Token Ring systems are priced between \$200 and \$500 per port; and router modules range in price from \$3,995 for one LAN protocol and one WAN port to \$6,495 for dual LAN protocol and dual WAN support.

► **Fibermux**  
(818) 709-6000

**Softwarehouse Corp.** has announced Version 3.6 of the Connection Manager, a modem server package for IPX and NetBIOS networks.

According to the Los Altos, Calif., company, Version 3.6 adds a Windows communications driver redirector that enables any Windows or Windows for Workgroups communications program to use shared modems on the network for data or fax transmissions.

Version 3.6 provides four separate communications programs: the Novell, Inc. NASI interface, the standard interrupt 14 interface, the Windows communications driver redirector and Softwarehouse's extended interrupt 14 interface.

An entry-level "lite" version costs \$195; the standard version costs \$395. It supports up to 16 modems per server and unlimited clients and works across network bridges and routers.

► **Softwarehouse**  
(415) 949-0203

**TBS Software, Inc.** has announced PS-Export, an export agent for IBM's Office-Vision/MVS, and CC-Import, an import agent for Lotus Development Corp.'s CC-Mail.

Both are part of the company's Migra family of host-to-LAN electronic-mail migration products.

According to the Markham, Ontario, company, PS-Export exports user definitions and mail for migrating users.

PS-Export defines users and automatically imports their mail when it is used in conjunction with a Migra import agent running on a LAN.

CC-Import automatically defines migrating users on CC-Mail and imports their mail when used in conjunction with a Migra export agent running on a host.

Prices range from \$2,900 to \$9,900.

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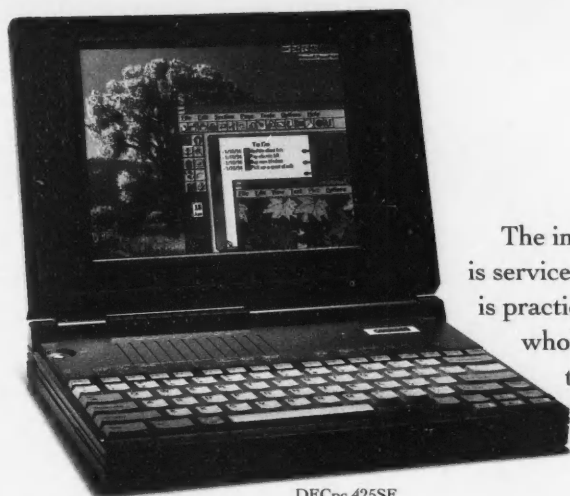
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## New York State picks bank for tax system revamp

By Mark Halper

If you are looking to outsource your data processing needs, who should you call? A technology outsourcer, right?

Nope. Not if you are the New York State Department of Taxation and Finance, which in late January tapped a financial services company, Fleet Financial Group, to guide it through the next 10 years of computerized tax collections and refund payments.

Fleet Financial will start handling returns during next year's tax season. However, the \$197 million contract is not without a traditional outsource. Computer Sciences Corp. (CSC) in El Segundo, Calif., is responsible for software development as a subcontractor. But the department never considered CSC or its traditional outsourcing rivals as the prime contractor.

That is because the tax collection and payment processes involve so many banking procedures it simply made more sense to hire a bank, noted Arthur Gross, deputy commissioner for revenue and information management.

### A smoother ride

Hiring a technology company, he observed, would not have eliminated the many inefficiencies built into the current system. The state often serves as an unnecessary stopover for tax returns on their way to a bank.

For instance, the state currently receives more than 2 million checks along with the 10 million personal income tax returns filed each year. In a paragon of wheel-spinning, it ships those checks off to one of about 40 banks, which in turn deposits the checks, captures data and then sends information back to the state.

"We're doing a Tinkers-to-Evans-to-Chance process," Gross said, referring to the famous trio of baseball players known for executing a double play in which at least three players touch the ball.

"We said, 'This is nuts; there's got to be a better way,'" he recalled. "We stepped back and said, 'The bank has to get a lot of this information. Why shouldn't they get it directly instead of it banging around all over the place?'"

Industry observers credited New York with taking a fresh approach but noted the jury is still out on whether a bank can adequately meet the technology challenges.

"Usually these sorts of contracts go to IS vendors," observed Rishi Sood, an analyst at G2 Research, Inc. in Mountain View, Calif. "It will be interesting to see if it has problems, to see if other states might want to do the same thing."

The contract reduces the state's estimated processing costs

over the next 10 years by \$80 million, and although improved technology will contribute to those savings, "the focal point was not necessarily the technology," Gross explained.

The state issued requests for proposals (RFP) to about 73 information technology companies, but it specified that they could only come in as subcontractors, Gross said.

At the same time, it issued RFPs to about 16 financial institutions. In the end, Chemical Banking Corp. bid against Fleet Financial, which won because it offered a better financial deal, Gross said.

By hiring a bank, the state is saving money on several fronts.

Gross pointed out that banks routinely perform the same procedures for all their customers that Fleet Financial will perform for the state — namely, depositing and tracking remittances. Because banks know how to do these jobs, they can do a better and more efficient

job than the state. Gross estimated that with the use of new imaging and scanning technology, Fleet Financial will perform its state tax-related work in 40% of the time it would take the state.

"They can do this work with a lot fewer people, and they can leverage the technology for other banking purposes," Gross said.

Of course CSC and technology are playing a big role in the cost-savings process. The department will continue to rely heavily on its IBM and Unisys Corp. mainframes. But while the back-end architecture is not changing, the front end is because Fleet Financial and CSC are installing imaging and scanning technology to improve processes.

The first project on the table is the installation of an AT&T Global Information Solutions (formerly NCR Corp.) 7780 scanning system to read data from the 2.3 million coupons that arrive quarterly from self-employed taxpayers, who must file estimated earnings, and from any checks that come in with them.

### Additional benefits

Gross explained another cost benefit that will kick in immediately from the scanning system: Using an Informix Corp. database on a Hewlett-Packard Co. HP 9000 Model 800 G40 computer, the bank will check street addresses on forms to ascertain whether the filer claimed residence in the proper locality. New York state law requires special filings for New York City or Yonkers residents.

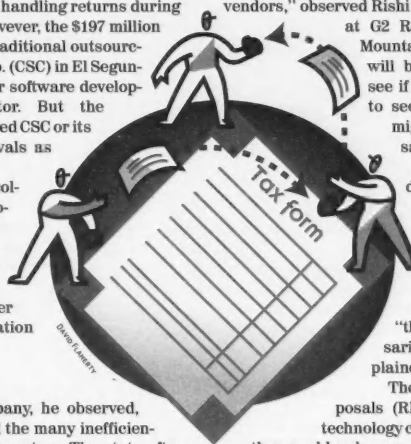
The current system requires manual checks of some 10 million forms to sort out about 2 million incorrect forms, Gross said.

The state will realize some of the cost-savings by reassigning about 300 permanent employees from processing tasks to entirely new jobs aimed at revenue generation, such as disproving taxpayer complaints of inaccuracies.

The outsourcing has also slashed the number of seasonal workers the state needs to hire during tax season from around 1,400 to about 300.



Arthur Gross, deputy commissioner of revenue, says it simply made more sense to hire a bank



### License management

## IBM considers outside help for software license management

By Craig Stedman  
ANAHEIM, CALIF.

IBM plans in the months ahead to start expanding its software license management capabilities for host systems, a necessary step as the company looks to shift more mainframe applications from traditional tiered pricing to a model based on the number of users.

But IBM must first decide whether it wants to continue the proprietary license management technology supported on some System/390 software products or switch to another license manager — most likely Gradient Technologies, Inc.'s IFOR/LS, which IBM has already adopted for its OS/2 and AIX platforms.

"We're just in the process of sorting that out now, but I wouldn't say that any official decisions have been made yet," said Linda Hubbard, manager of IBM's software business strategy, at the recent Share, Inc. users group meeting here. "We have more work we have to get through."

### No time line yet

Hubbard would not say when IBM is likely to decide which technology would provide more advanced license management capabilities. License managers are needed to ensure that the appropriate number of users can access an application at the same time.

Several users at the Share conference said they would welcome better license management capabilities.

"There are valid reasons for it from the customer side as well as [from] the vendor side," including the avoidance of lawsuits from companies for illegal use of their software, said John Chapman, a senior technology consultant at Amoco Corp. in Chicago and president of Share.

"Most large companies don't want to cheat vendors. It's just that they don't have any choice right now" because of a lack of tools for tracking software use, added David Thewlis, a technology planner at Kaiser Permanente's

medical care program in Eureka, Calif.

The usage-tracking capabilities provided by license managers also present the opportunity for customers to manage their installed software as an asset, Chapman noted. Companies should be able to get a more exact idea of the number of licenses they need for a particular application, he said.

### Limitations

IBM's proprietary Software License Monitor (SLM), introduced in late 1992, provides some of the necessary license management functionality, but it also has its limits, according to Hubbard. Chief among the limitations, she said, is

License management, page 64





## License management

CONTINUED FROM PAGE 63

the fact that SLM is an IBM-only product.

"If every single developer writes his own [license management] tools, we will really bring IS shops to their knees here," Hubbard said. Gradient's software, on the other hand, has been licensed by Hewlett-Packard Co., Novell, Inc. and other vendors in addition to the OS/2 and AIX groups at IBM.

### Consistency

Hubbard said it also would make sense to use the same license manager across all of IBM's operating systems. However, she noted that IBM is not yet convinced that the Gradient technology is robust enough to handle a large mainframe environment.

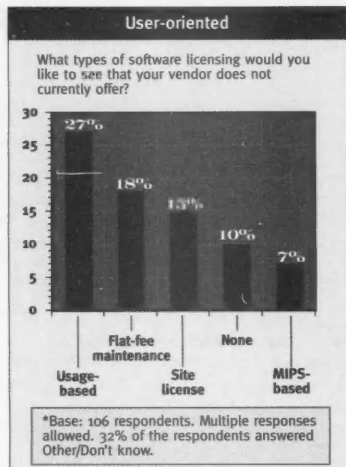
"Some things that work in the OS/2 world may not work so well as you get to the System/390 level," Hubbard said. She declined to list any specific shortcomings in iFOR/LS but indicated that backup and disaster recovery are two license management areas that in general need to be more fully developed.

Len Halio, president and chief executive officer at Gradient, based in Marlboro, Mass., said he

was not aware of any technical deficiencies that would prevent iFOR/LS from scaling up to the mainframe environment. Any hesitancy on IBM's part "is probably not product related," he added. "Sometimes companies have to be very careful for political or organizational reasons."

### Platform questions

Halio would not comment directly on Gradient's discussions with IBM regarding MVS or VM support,



Source: Computerworld Database Division, Framingham, Mass.

but he said he expects "that more and more IBM platforms will come out with our software. It may still take time, and particular platforms might have their own rollout schedules."

## Reporter's

### Notebook

Notes from the Share, Inc. user group meeting in Anaheim, Calif. include the following:

Version 4.1 of IBM's CICS/ESA transaction monitor is likely to become generally available late this year or early next, according to product manager Ian Harvey. The software is just starting an early shipment phase, he said.

Harvey noted that about 10% of the functionality in Version 4.1 is targeted at the CMOS-based parallel processors that IBM is expected to formally introduce in April. "From a transaction point of view, CICS may map better to [the parallel] setup than the large systems we now have," he said.

Regarding future direction, Harvey said the next CICS/ESA release will support the sharing of VSAM data among multiple systems. That version is due out within two years and will require then-current versions of MVS and VSAM, he indicated.

IBM plans to support its Adstar Distributed Storage Manager software for backing up LANs on platforms other than MVS and VM mainframes beginning in the second quarter. Versions for AIX/6000 and OS/2 are due out then and will be followed in the third quarter by releases supporting the AS/400 and Unix systems from Hewlett-Packard and Sun Microsystems, said Dick Kallmeyer, senior planner for business development at IBM's Storage Systems division. The network backup product was introduced last July for MVS and VM, and IBM has sold about 400 licenses thus far, Kallmeyer said.

When is ATM (Asynchronous Transfer Mode) synonymous with ATMs (automated teller machines)? When IBM Senior Vice President Ellen Hancock discusses the

emerging networking technology with the company's CEO Lou Gerstner.

"When I've talked to him, I've told him that ATM is like a cash-issuing machine. The cash just comes a little later," Hancock said during a speech at Share. The acronym ATM loomed large in virtually all of Hancock's slides, and she said IBM expects it to be "the defining network technology for the next 15 years." However, she added that vendors could end up creating "so much hype that we will build up damaging expectations about this technology."

While IBM is hoping its upcoming parallel processing mainframes will revitalize host sales, Share officials are looking for a similar impact on attendance at the user group's meetings. About 3,000 people were expected at this year's winter meeting, down from 3,649 a year ago and 5,472 in 1991. The recent earthquake in Southern California received part of the blame for keeping attendance down, but Share treasurer Paul Foley said the group is counting on the parallel technology, plus an increased emphasis on things such as OS/2, to provide new reasons to go to the conference. Despite the attendance drop-offs, Foley said the user group remains financially sound.

A "shootout" between OS/2 and Microsoft's Windows NT did not provide actual head-to-head sparks beyond the usual back-and-forth marketing gibes. But it did present a sharp contrast between the companies' approaches to showing off their operating systems. Microsoft loaded the stage with 12 different NT systems, including dual processors based on both Intel's Pentium and Silicon Graphics' R4000-family RISC microprocessors. IBM used a plain old 33-MHz, 486-based PC to put OS/2 through its paces.



## Briefs

### SmartMode debuts

**Information Builders, Inc.** has introduced SmartMode for DB2, an intelligent query system that controls and monitors information requests sent to IBM's DB2 database. The product is available now; prices range from \$24,000 to \$49,500.

### New customer service IS

**Andersen Consulting** in Chicago will develop and install a new customer service information system for San Francisco-based **Pacific Gas & Electric's** 20,000 "noncore" customer accounts. The client/server application may be scaled up to handle all of Pacific Gas & Electric's 7.7 million residential and business accounts.

### FileTek announces LAN-Ammo

**FileTek, Inc.** in Rockville, Md., last week introduced a client/server version of its Ammo-II COM (Computer Output to Microfiche/microfilm) mainframe product. LAN-Ammo makes archived data available to users on networked machines on Token Ring and Ethernet LANs, as well as networks supporting NetBios or TCP/IP. Client software licenses are priced from a high of \$299 per workstation in quantities from 30 to 100; the server licenses are equal to the cost of two LAN-Ammo products.

## Solaris gets call-management support

By Jean S. Bozman

Sun Microsystems, Inc. is entering the market for customer service and support applications in part to boost sales of its large-scale Unix servers.

To do so, Sun is bundling a software library into subsidiary SunSoft, Inc.'s Solaris 2.x operating system to support call-management applications. The software requires Sun's large-scale SPARCcenter 2000 Unix servers to run.

The move, announced with some 40 business partners at ComNet '94 in Washington, is a way to package high-margin SPARCserver 2000s with database applications and telephony interfaces for use by mail-order firms and telephone companies. "We consider it the first of many commercial market programs we're going to be launching," said Lee Sigler, manager of strategic initiatives at Sun.

"Hardware is becoming ever more a commodity, and hardware vendors like Sun are pursuing added value in knowledge and applications software for specific industries," said Jeffrey Canin, an analyst for Salomon Brothers, Inc. in San Francisco.

Sun informally stepped into the customer service arena this fall by selling an early-ship 16-way sym-

metrical multiprocessor SPARCcenter 2000 to the Fingerhut Cos. in Minnetonka, Minn. [CW, Feb. 7]. The machine is the first of four SPARCcenter servers that will take over production of customer service and order-processing applications from an IBM ES/9000 mainframe running IBM's IMS database, according to Fingerhut.

To support call management, a new software library called XTL is being bundled into the Solaris 2.x operating system, said Doug Ehrenreich, manager of Sun's telecommunications industry marketing. "We are going to create this [application programming interface] and present it to our customers by allowing them to integrate voice initially and other networking technologies as they become available."

Among these are frame-relay, 100M bit/sec. Fast Ethernet and Asynchronous Transfer Mode networks. SunSoft began shipping XTL developer kits to telephony partners late last month.

Solaris' XTL Teleservices will support call-center software, integrated voice mail, fax, videoconferencing, E-mail and on-line video training applications. Sun is working with Andersen Consulting, MCI, AT&T Network Systems and 40 other firms to integrate its Unix servers, Solaris and third-party applications.

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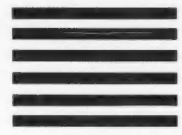


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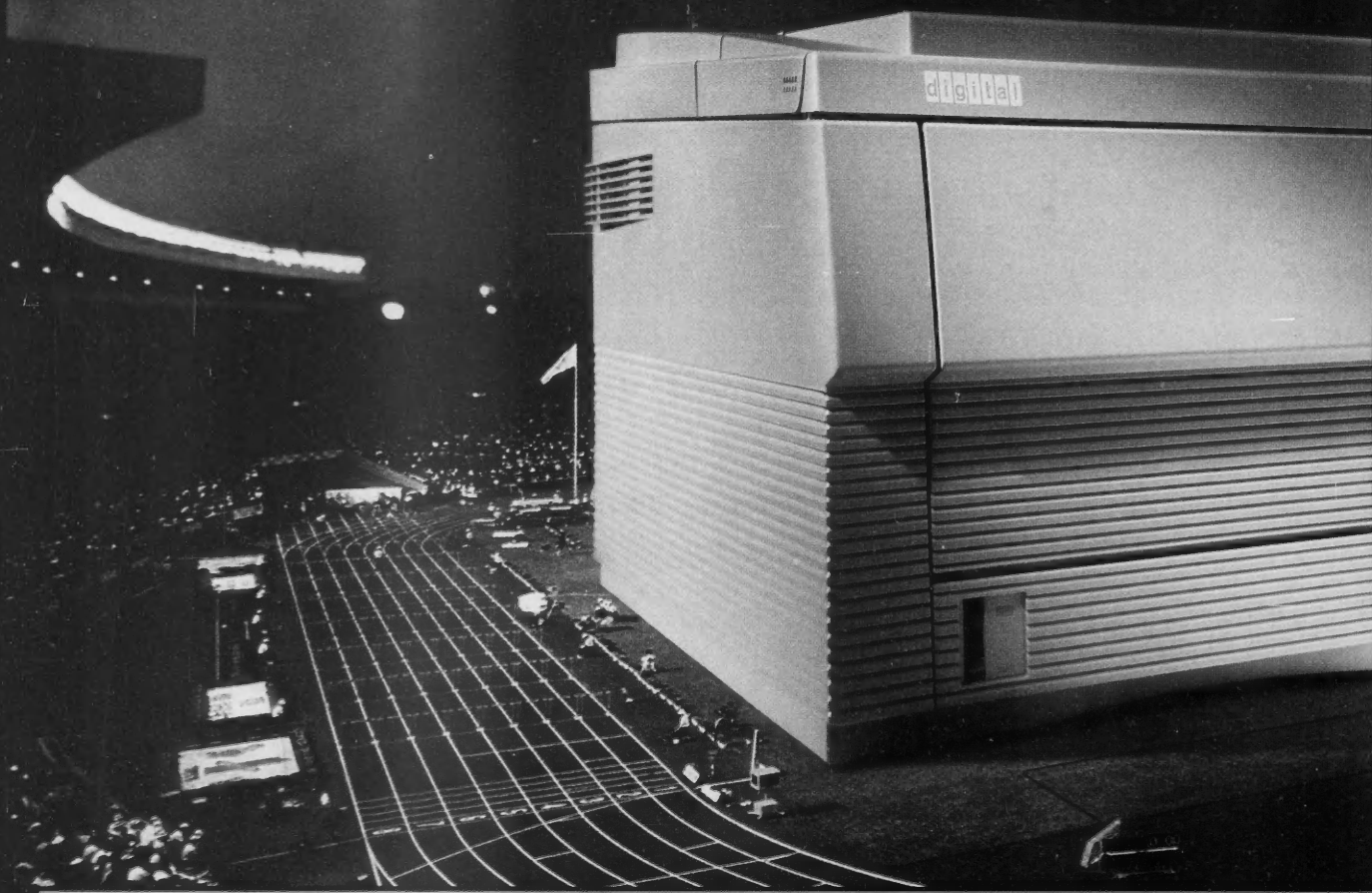
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## Large Systems

**Avalon Software, Inc.** has introduced Version 8.6 of Avalon CIIM for Oracle Corp.'s relational database.

According to the Tucson, Ariz., company, CIIM is a family of integrated applications used by global manufacturing enterprises. Version 8.6 lets users develop efficient production-line schedules by reducing the amount of data entry required for manufacturing planning.

CIIM consists of 12 fully integrated client/server applications that include planned-order consumption, automated material dispatching and enhanced international support.

Prices range from \$75,000 to \$750,000.

► **Avalon Software**  
(602) 790-4214

**Unitech Systems, Inc.** has introduced ACR/Detail-VMS, an Information Integrity product that lets OpenVMS users automatically reconcile detailed data at a transaction or item level.

According to the Naperville, Ill., company, ACR/Detail-VMS extracts detailed data, including employee deductions, customer payments and department expenses, through user-defined rules and parameters.

The product extracts data from files, reports and Rdb databases.

License fees begin at \$13,000.

► **Unitech Systems**  
(708) 506-1800

**Generic Software, Inc.** has introduced Release 1.1 of Inventory Control, a full-function inventory system.

According to the Madison, Miss., company, the product can be used as a stand-

alone inventory system or used in conjunction with its Purchasing and Order/Entry/Invoicing systems, creating a fully integrated distribution system.

Features include on-line entry and editing of master files and transactions; sales analysis quantities; amount and cost of sales for month-to-date, year-to-date and prior year; item and transaction register inquiries; and a multicompany capability.

Inventory Control for System/34/36 costs \$395 per CPU. Inventory Control for the AS/400 is available for \$495 per CPU.

► **Generic Software**  
(601) 853-1189

**Prism Solutions, Inc. and Digital Equipment Corp.** have announced the availability of Prism's Warehouse Manager software for Digital's OpenVMS platforms.

According to Prism in Sunnyvale, Calif., the combination of Prism's Warehouse Manager and Digital's AccessWorks family of database servers enables enterprises to construct and use data warehouses for more cost-effective information processing.

The product automates the transformation of legacy data from enterprise-wide source environments, including DB2, DEC RMS, CA-IDMS, VSAM and sequential files, to a data warehouse or informational database management on a target database system. Programming is not required.

Prism Warehouse Manager costs \$95,000. Users can add other source modules for an additional \$20,000 each.

► **Prism Solutions**  
(408) 481-0240

**Firesign Computer Co.** has announced rlog6.2, a software product designed to

enable mainframe shops to support and maintain distributed Unix workstations from a centralized location.

According to the San Francisco company, the product lets users log on to remote Unix workstations and perform maintenance, testing and administrative tasks.

By employing an organization's existing Systems Network Architecture enterprise network, the need for TCP/IP, modems or telephone lines is eliminated.

The product is available for IBM's AIX on the RISC System/6000.

A central subsystem costs \$2,995, and remote software is available in bundles of five at \$299 per remote node.

► **Firesign Computer**  
(415) 398-7228

**Usonic, Inc.** has introduced the System line, a series of four on-line uninterruptible power supplies.

According to the Aliso Viejo, Calif., company, the series provides power protection for midrange computers, network nodes, workstations and stand-alone PCs involved in mission-critical applications.

Features include output voltage regulation of plus or minus 3% variation over an input range of plus 15% to minus 25%; LED indicators; a "Hot Start-up" capability; remote shutdown capability; and a master LCD display offering two lines of 16 characters each for clear status messages to the user.

Power ratings range from 600VA to 3KVA.

Pricing starts at \$895.

► **Usonic**  
(714) 448-9500

**Softbase Systems** has announced Complement, an application enhancement tool designed to provide Online Help and Documentation.

According to the Asheville, N.C., company, Complement uses IBM's Common User Access-compliant windowing technology, providing flexibility and usability for any VTAM application.

The product can access Help and Documentation text from any source and does not require programming changes or subsystem modifications.

Prices start at \$28,500.

► **Softbase Systems**  
(704) 251-9002

**Software PM, Inc.** has announced Alert, an IBM AS/400-based system security product designed to provide local and network security over any size or geographical AS/400 network.

According to the Milwaukee company, features include interactive menu control, program control, object control and application control.

Alert also offers detection techniques that can warn users of any rogue objects, data violations or unauthorized access.

An all-hours surveillance system is provided. Prices range from \$1,500 to \$37,500.

► **Software PM**  
(414) 545-1414

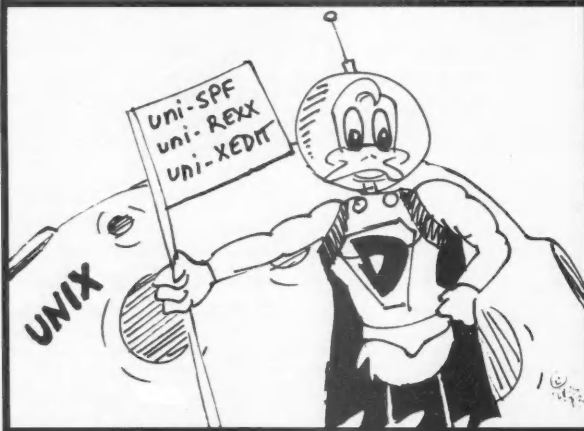
## Product shorts

**Archidata Systems, Inc.** has announced DataMan, a data management system that creates a database architecture by taking a complete inventory of all data used within any enterprise — PCs, master files, databases, screens, forms and reports. A database architecture is formed from the source data and completely cross-referenced back to the source data generating a migration path from legacy systems. Cost: \$47,500 per copy. Archidata Systems, Orange, Calif. (714) 282-7833. . . . **Velocity Software** has introduced VCMon, the VM Connectivity Monitor designed to provide real-time and historical performance monitoring for VM/ESA connectivity products. The tool analyzes and records system accounting data produced by VM/ESA and the connectivity products it runs, then generates real-time displays of the data. Cost: Annual fees range from \$1,500 to \$4,500. Velocity Software, Boston, Mass. (617) 825-3599.

**Andrew Corp.** has introduced SuperStar/500, an intelligent active star/multiplexer repeater designed for IBM's AS/400 and System/3x hosts. The product automatically detects reversed polarity errors and corrects them by port. Cost: \$745 to \$1,495. Andrew, Orland Park, Ill. (708) 349-3300. . . . **Synapse Computer Services, Inc.**, in conjunction with **Syan Ltd.**, has announced the Automated Operations System (AOS), AS/400-based control software. AOS comprises 10 modules: scheduling manager, tape manager, message manager, change manager, paper manager, security manager, print manager, job accounting manager, storage manager and user environment manager. The modules are command- and menu-driven, IBM Systems Application Architecture-compliant and OS/400 release level-independent. Cost: starts at \$1,250. Synapse Computer Services, Branchburg, N.J. (908) 526-8488.

**Search Software America, Inc.** has announced Version 1.6 of SSA-Extensions, a product designed to enhance the value of SSA-Name3, the company's name-search software. The product lets users determine whether two or more names in a database are actually the same person or company. SSA-Extensions compares information such as name, address, identification number, gender and date of birth, regardless of missing words, abbreviations, pronunciation, handwriting or spelling errors. Cost: ranges from \$9,000 to \$24,000 for a mainframe license. Search Software America, Old Greenwich, Conn. (203) 699-2399. . . . **Integral Systems, Inc.** has announced the availability of its InPower HR program for Sybase, Inc.'s SQL Server relational database management system. InPower HR is a client/server human resources application that lets users simultaneously run a single application on different platforms. It also provides adaptable business event processing and business rules separate from application code. Cost: starts at \$125,000. Integral Systems, Walnut Creek, Calif. (510) 939-3900.

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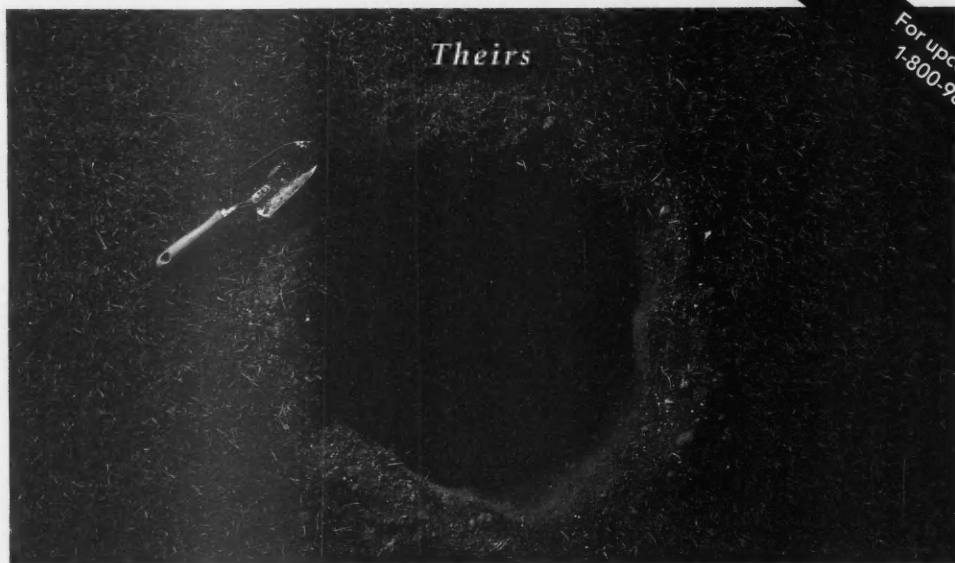


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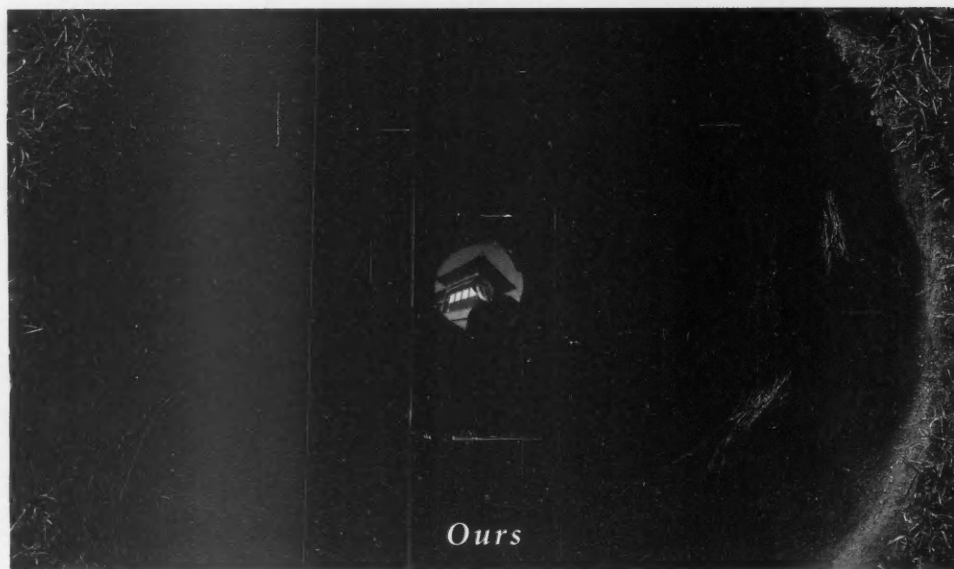
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Tim Lynch

## Avoiding another Tower of Babel



Here we are at the start of a new era, a new dimension of custom business application development techniques. And here we are looking back and trying to figure out what we can do differently so we don't wind up in the same muddle a few years from now: too bogged down in maintenance to move ahead.

How do we prevent it? Now that we are dealing with graphical user interface (GUI) code, middleware code and server code, how can we hope to achieve greater maintainability than we've managed thus far? How do we avoid creating another mess of applications that are full of redundant data items, written in a plethora of software languages and use truckloads of data storage and teleprocessing techniques?

It won't be easy. Creating these new kinds of programs does add complexity. When you are dealing with GUIs, for example, the old ideal of one program/one panel is no longer realistic. One application in the GUI environment can be thought of as a group of windows, where one window is driven by an unlimited number of unique or shared subroutines employed by objects in that window.

Such differences make maintainability more critical than ever, but that doesn't mean that extreme or exotic measures are required. All it means is that we need to pay a lot more attention to basic principles of good development practice that are currently honored more in theory than in practice.

### Step by step

A first step might be to stress simplicity. If you can use a one-dimensional table, instead of a two- or three-dimensional one, do it. If you have to do something complex, document it in English plain enough to be understood when you have a code walk-through. (You do have your teammates walk through your code before implementation, don't you?)

Another step is to free up more time to do the actual code fixing. Many corporations these days have jumped on the quality assurance bandwagon, but unfortunately many of the quality programs concentrate less on code quality and in-program documentation than on upfront paperwork — forms to be filled out in triplicate and filed in dusty cabinets. Quality assurance groups should pay closer attention to the documentation of the actual programs.

At a minimum, each module should have some kind of documentation that explains what the program does, the I/O functions, the related programs/panels and a modification log. This is in the working program, not on some form in a cabinet somewhere. When a programmer is fixing a program, he goes to the code, not to a file cabinet. That is the living document and should contain just about everything necessary to understand an application's purpose in life.

Quality assurance groups should also be involved in testing. They should serve as stand-ins for users and try to replicate users' ability to push programs to their breaking points. This would require these groups to get much further into the details of applications, but it would save users the trouble of having to serve as guinea pigs and help us avoid falling into another, possibly deeper, maintenance bog.

Lynch is a senior analyst at Florida Power & Light Co. in Juno Beach.

### GUI builders

## FAA expert system aims sky high

By Gary H. Anthes  
WASHINGTON

An air traffic management specialist in Washington recently diverted a large number of airplanes approaching Chicago to outlying airports during a thunderstorm. While that seemed a reasonable action at the time, it was not the optimal one. An airline lost millions of dollars when it discovered the next day that a sizable number of its aircraft were not where they were supposed to be and had to retrieve them.

Aided by an expert system called Smartflow Traffic Management System, the Federal Aviation Administration hopes to soon curtail such occurrences. Smartflow — now in beta testing at the agency — would have used expert rules tailored to local conditions to suggest that Chicago-bound aircraft be held on the ground at their origins rather than flown to alternate destinations.

Smartflow is a flexible and powerful system — incorporating decades of air traffic control experience — yet it is being developed by one person: a senior programmer at Computer Sciences Corp. He

cle the airport and so on — some 40 traffic management specialists in a national command center determine how the entire national airspace system is to run each day, planning hours in advance in the

face of snowstorms, accidents, closed runways and the like.

With 50,000 flights a day from 300 major airports, air traffic control is a task of such extraordinary complexity that one FAA official described it as the equivalent of fighting "a Desert Storm every day." The air traffic wizards in the FAA's Central Flow command center must understand situations spanning thousands of miles, keeping in mind such

details as fog in San Francisco usually lifts by 10 a.m. and a certain runway at Boston's Logan International cannot be used after sunset because it is not lighted.

An existing system allows FAA air traffic management specialists to perform limited "what-if" anal-

FAA, page 75



Computer Sciences' Smartflow monitors airport data 24 hours a day

said an easy-to-use graphical user interface (GUI) builder has saved him months of effort while allowing him to bring users onboard at the outset by quickly generating prototypes.

While air traffic controllers in airport towers issue local tactical commands — take off, turn left, cir-

## Microsoft adds another piece to Office strategy

By Stuart J. Johnston

■ Microsoft Corp. will ship a tool kit early next quarter to help corporate developers create custom applications based on its Office suite and Visual Basic.

The Office Development Kit, which will cost \$99.95 on CD-ROM, will feature developer's kits for Excel 5.0 and Word 6.x, company officials said. It will also include an electronic forms designer, a browser for viewing Object Linking and Embedding (OLE) 2.0 objects, sample code and a wide range of documentation, said Kathleen Schoenfelder, group product manager for Excel in the Office products group.

The Office Development Kit will be available free inside all new copies of Visual Basic 3.0 Professional Edition and will cost \$49.95 for other users.

One user at a major corporation said the tool kit will likely "fit in" with his company's plans.

"It sounds like stuff we could definitely use [because] the Office fleet [of products] fits in well with the current downsizing trend," said John Miele, a consultant at chemical and pharmaceutical firm Ciba Geigy in Greensboro, N.C.

"It sounds like an attempt to do what [Lotus Devel-

opment Corp.'s] Notes did, but I guess it's a good thing," said Esther Dyson, president of analysis firm EDventure Holdings in New York. "The whole world is getting more programmable, and people are discovering that all their applications can be scripted."

"To some extent, [Microsoft has] an advantage over Notes because [its applications] are not as seamless. They'll push the notion that applications are interchangeable but guess whose work together the best," she said.

### Game plan

Microsoft officials said the kit is one component of the company's evolving Office solutions strategy.

Key to that strategy are the new versions of the Excel spreadsheet, Word word processor and the PowerPoint 4.0 presentation graphics package, all of which "expose" their internal "objects" to access from outside macro languages, including Visual Basic, Schoenfelder said. Those objects make up each application's internal functions and capabilities and make them callable from external programs.

The standard edition of Office contains Excel, Word, PowerPoint and Microsoft Mail; a professional edition adds Microsoft's Access database.

Visual Basic and Visual Basic Applications Edition (VBA), which is included in Excel 5.0, constitute a second component of the strategy. A third component, OLE 2.0, provides the "glue" that lets applications in-

Office, page 75



# Tool kit aimed at wireless apps

By Ellis Booker

Just as nationwide wireless wide-area networks expand and diversify, so does the selection of third-party software tools for mobile applications.

Late last month, a small firm in Schaumburg, Ill., introduced a developer's tool kit that adds wireless connectivity to existing client/server applications.

Client Server Technology, Inc.'s system, called Mobile Empowered Collaborative Computing Architecture (MECCA), supports a variety of wireless networks, including those from carriers Ardis and RAM Mobile Data. It also supports the Cellular Digital Packet Data data-over-cellular protocol.

"Rather than develop new applications or make tortuous modifications of existing applications, [Client Server Technology] is saying they can just add the radio piece," said Ira Brodsky, president of Datacomm Research Co., a market research firm in Wilmette, Ill., that specializes in wireless data communications. To that extent, the company's modular approach maps nicely to the goals of client/server, he said.

Nevertheless, Brodsky said Client Server Technology's tool may not be "compelling enough" for today's customers, many of whom have yet to ask "why wireless is important to them or why it's urgent for them to use it."

At present, most wireless network applications involve store-and-forward electronic mail and simple file transfers. But the benefits will accrue only if the tool also provides access to and from mission-critical databases, according to Client Server Technology executives.

Still, there is a question about whether the response time across a wireless network is suitable for client/server.

Client Server Technology President Gary Arakelin acknowledged that the new wireless networks are slower than their wired brethren. "But it's a [delay] of six or seven seconds compared to not getting the data into the field at all," he said.

In addition to wireless connectivity, MECCA provides a way to build personal and corporate profiles (rules) to manage the routing of data to mobile users. MECCA's rules database can also auto-

mate activities such as sending updated flight information to a mobile user's personal digital assistant before the user requests it.

In a test, MECCA object-based function buttons were pasted into a Borland International, Inc. Paradox for Windows database. This, plus a recompiling of the new code, took less than five minutes.

MECCA's development kits will initially support Powersoft Corp.'s PowerBuilder, Microsoft Corp.'s Access and Visual Basic, Borland's Paradox for Windows and Unix environments. Client Server Technology also plans to support Novell, Inc. NetWare Loadable Module agents and other popular applications.

Client Server Technology's first MECCA product, AirClient, is slated to ship in April. Its first release will feature Windows Dynamic Link Libraries that work with the Ardis and RAM Mobile Data networks and support several DOS commands. Future versions of AirClient, due out late this year, will support Unix and NetWare.

An AirClient license will cost \$199 per PC and \$495 for each graphical user interface-specific MECCA Developer Tool kit.

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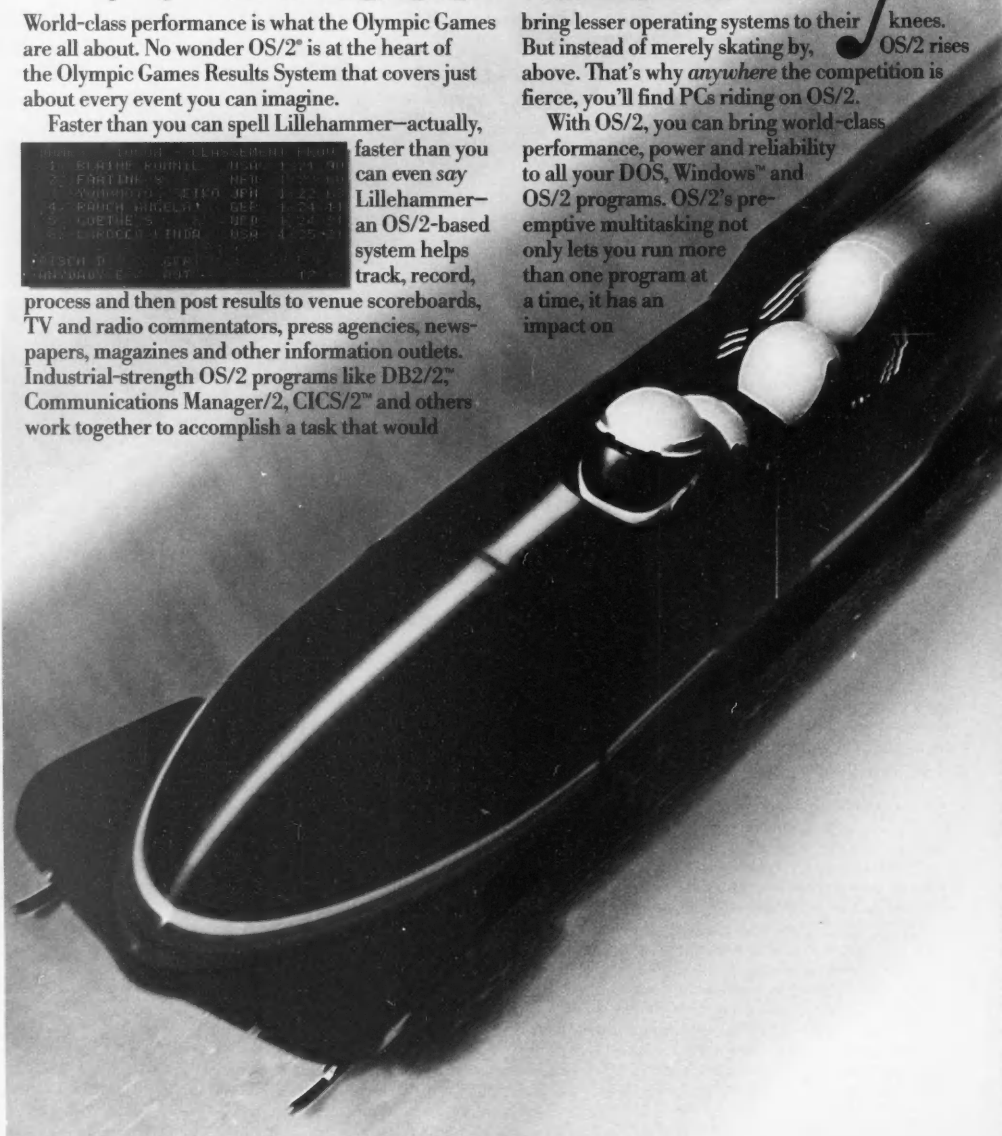
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## FAA

CONTINUED FROM PAGE 73

yses such as, "How would a one-hour delay in Atlanta affect arrival rates?" But Smartflow will be proactive, monitoring a database of information on airport and runway status, weather, flight schedules and aircraft positions 24 hours a day.

Looking eight hours ahead, it will spot

problems and suggest solutions such as slowing flight speeds and increasing aircraft spacing, rerouting planes to alternate airports or delaying takeoffs.

Smartflow presents color-coded maps at three levels—the entire U.S. airspace, showing 20 regional FAA air traffic centers; individual regions, showing individual airports; and individual airports, showing the location of runways, tower and terminals. Users can click on key objects at each level for more detail and up-

to-the-minute status.

Smartflow was developed using TAE Plus, a GUI builder from Century Computing, Inc. in Laurel, Md. The company bills it as a GUI generator for nonprogrammers, and its key user on the Smartflow project buys that description.

"I looked at several other GUI builders, but they required that I know [Open Software Foundation's Motif or X Windows]," said Kevin Brett, senior programmer/analyst at Computer Sciences, which is

developing the system. "I was not a GUI builder. But I don't need to know anything to use this."

Brett said he generated the first six prototype screens in less than a week, then spent two weeks side by side with a user fine-tuning them.

The GUIs that Brett developed in two months—30 screens, 100 buttons and 50,000 lines of C++ code—would have taken at least 12 months to create using OSF/Motif- or X Window System-based approaches, he said.

Smartflow will employ about 15,000 expert rules pulled from 10 FAA air traffic veterans, Brett said. "Most of the people in Central Flow are there for two-year tours of duty," he said. "But a few have been there 10 to 20 years, and we are trying to pick their brains big time." Rules for three of the Top 30 airports have been coded so far.

Smartflow is written in C++ and runs on a Hewlett-Packard Co. HP 9000 Model 800 server attached to six smaller HP 9000s in a LAN. Expert rules are written in a NASA-developed C-based language called CLIPS.

## Office

CONTINUED FROM PAGE 73

tegrators write Visual Basic and VBA programs that automate tasks within and between the Office applications, a feature called OLE automation.

Together, Visual Basic provides "syntax" or programming tools, OLE provides automation support, and Office provides the objects.

For example, an integrator could write a VBA program in Excel that generates a spreadsheet chart using data that it acquires through Microsoft Mail and then could paste that chart into a document in Word.

The recent shipment of PowerPoint 4.0, which completes the latest round of updates for Microsoft's major productivity applications, means that Excel, Word and PowerPoint can all work in this manner, Schoenfelder said.

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"Who developed this?"

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## Application Development

### New Products

**BBN Software Products Corp.** has announced BBN/Cornerstone Extension Language (CEL), a development environment that lets users customize and adapt BBN/Cornerstone data analysis software to meet specific needs.

According to the Cambridge, Mass., company, CEL comprises an object-oriented programming language and an integrated set of development tools designed to meet the requirements of data analysis applications.

On-line help, visual programming tools and a library of object classes for custom data analysis applications are included.

CEL costs \$995 for a fixed license and \$1,995 for a floating license.

► **BBN Software Products**  
(617) 873-5000

**Kofax Image Products** has announced Kofax Image Processing Platform (KIPP) ImageControls for Visual Basic and Visual C++, a suite of object-oriented imaging development tools.

According to the Irvine, Calif., company, KIPP ImageControls provides a drag-and-drop environment that reduces the time to create production-level applications.

Features include high-volume scanning and display, text annotation and image "de-skewing" to straighten skewed documents during scanning and improve accuracy for optical character recognition. The product also offers rated-speed bar code recognition during scanning and job separation detection for electronically sorting documents during batch processing operations.

Prices start at \$1,495.

► **Kofax Image Products**  
(714) 727-1733

**Pencom** has introduced Co-Xist 3.2, a product line that allows NextStep users working on Intel Corp.-based PCs to run X Window System-based Unix applications.

According to the Austin, Texas, company, the product gives NextStep users access to hundreds of popular X-based applications.

Users can run any custom X-based software already used within their organization.

The product includes the ability to run X applications in 8-bit gray-scale, 8-bit pseudo-color and 16- or 32-bit color graphics mode; exchange data easily between NextStep and other windowing environments with full cut-and-paste capability; work with preferred window manager environments including Tab, Motif, and NextStep; and edit and launch frequently used X applications with a single point and click.

The product starts at \$195.

► **Pencom**  
(512) 343-6666

**Loox Software, Inc.** has announced Loox Version 2.0, an object-oriented software development tool for X Window

System users, and other products.

According to the Sunnyvale, Calif., company, the product can be used to customize any Unix-based program to create a real-time, object-driven graphical user interface.

LooxMaker is a vector-based drawing program with drawing and animation features. The product allows users to import scanned images or export images.

Users can also create dynamic links between objects.

LooxLib, a vector-based C function library, offers more than 200 functions.

A development license for the Loox graphics development system, including LooxMaker and LooxLib, is available for \$9,950.

► **Loox Software**  
(415) 903-0942

**Pinnacle Publishing** has introduced Code Print Pro, a printing utility designed for programmers using Microsoft

Corp.'s Access.

According to the Kent, Wash., company, Code Print Pro enables programmers to create higher-quality printouts of Access Basic code and makes printing more flexible and convenient.

Users can also select fonts, print routine names in bold and add headers and footers to their code printouts.

Code Print Pro is priced at \$99.

► **Pinnacle Publishing**  
(206) 251-1900

# RemoteWare,

and the  
CONVERSION

OF JARED FARRELL.

A skeptic  
FROM WAY BACK,

Jared Farrell the  
Salesman had out-  
lived more than

one attempt at automating field communications.

The near-daily software updates. Nightly communication sessions that didn't. Inventory that wasn't.

Prospects that...weren't.

So the fact that something called RemoteWare® had been implemented to automate sales processes for farflung laptop jockeys like himself had held little charm for Farrell. A client/server system built with software tools already happily in use in hundreds of large companies world-

wide, with automated dial-up communications for transporting centrally-created electronic forms, documents and reports between home office legacy systems and even the most remote PCs? Terrific. Plus routing and query facilities to make sales-critical information simple to get and easy to use...on the road. Excuse me?

But within just days of the fading hook shot that sent the CIO's announcement memo into Farrell's round file, he was using the new applications electronically dispensed by RemoteWare. Entering daily orders, filing expenses, and penning a humble note of thanks to the CIO, from 30,000 feet. All quietly and automatically delivered by RemoteWare while he slept. A fitting complement to the inimitable selling routine of one Jared Farrell. Indeed.

Now, as he slid into the Central Office Staff Room six months later and five minutes

late, Farrell watched the eyes of the room swivel towards him, like half a volley at Wimbledon. And the CIO and VP

of Sales were headed his way with...a plaque?

"Jared Farrell, Salesperson of the Year," it read.

Salesperson of the Year. Imagine that.

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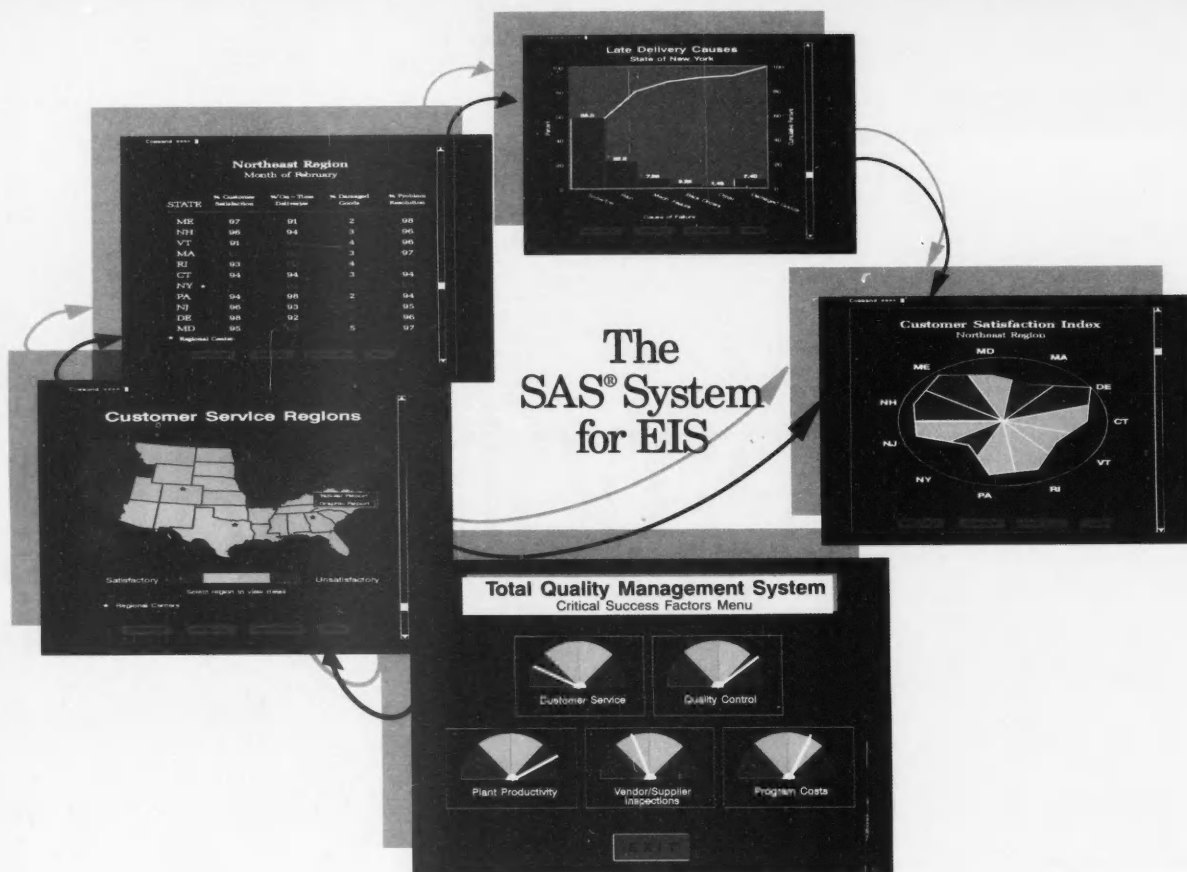
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specialized tools for project management, forecasting and financial reporting, and hundreds of other tasks...all fully integrated.

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# Management

Superstar companies in the mail-order industry have found that one key to success is providing exceptional customer service. That's no easy task when you never deal with your customers face-to-face. But with unique applications of existing technology, they're providing...



**Calyx and Corolla's Ruth Owades:**  
*We deliver fresh cut flowers so customers get 'life in the vase'*

## SPECIAL DELIVERY



ustomer service goes far beyond the smiles, pleases and thank-yous we usually think of as the building blocks for good customer relations, especially when representatives never deal with customers face-to-face.

Such is the case in the \$220 billion mail-order industry, where a company's ability to leverage its information systems to yield customer service benefits may be the most important differentiator among companies.

Customer service is all about adding value. In the mail-order business, this most often means increasing cus-

**By Joe Panepinto** tomer convenience.

"What people are looking for from a mail-order company is a level of comfort and convenience that makes them forget they are dealing with a company from a distance," says Marge Taggart, a consultant for Vanguard Communications Corp. in Morris Plains, N.J.

Throughout this diverse industry, a company does not need cutting-edge technology to support customer service as much as it needs to clearly apply existing IS technology to a customer service application that can differentiate it from its competition.

Companies that have stepped to the head of their class by providing an extraordinary measure of customer ser-

**Special delivery, page 80**

## Special delivery

CONTINUED FROM PAGE 79

vice offer a wide variety of products and services:

- Calyx and Corolla in San Francisco delivers fresh flowers nationwide the day after cutting.
- Spiegel Corp., a \$1.3 billion mail-order retailer based in Downers Grove, Ill., reduces customers' anxiety about merchandise returns by focusing on the back end of a mail-order sale.
- Software Support, Inc., a Heathrow, Fla.-based third-party software support company, improves the quality of information it receives from its PC support customers while it reduces the amount of frustrating repetition encountered

**The** mail-order business is a growing part of the landscape across a spectrum of industries — from PC hardware and software to apparel and fresh flowers. Marketing Logistics, Inc. in Highland Park, Ill., a publisher and consultant in the direct marketing industry, figures there are roughly 3,000 companies that deal with their customers exclusively through mail-order and another 5 million secondary marketers that include mail order as some part of their business.

tered in most service calls.

In every case, the goal is to increase convenience — the byword for customer service in the direct-mail and mail-order market.

### Fresher flowers faster

The old saying "Timing is everything" could be the catchphrase for the mail-order fresh flower business. Above all else, people who order flowers want to know their flowers will be fresh and will reach the right person on the right day.

By building a system that brings its 25 growers and a single package delivery company into the loop, Calyx and Corolla can guarantee exact-date, next-day delivery of flower arrangements that are fresher than those at the local flower shop. The flowers are cut the day of the order and shipped directly from the grower to arrive at their destination the next day.

"We have cut short the distribution system so the flowers are delivered to your home or office the day after they are cut," says Ruth Owades, president of Calyx and Corolla. "You get the life in the vase rather than in the truck or warehouse."

The formula has been so successful that Calyx and Corolla boasted \$13 million in revenue for 1993, filling more than 300,000 flower orders for the year.

In contrast, 1-800-Flowers and Florists Transworld Delivery, the two largest mail-order competitors, serve as "middlemen" for customers and florists, not growers. They may take up to five days to fill an order, and flowers

arrive only as fresh as they were at the florist shop, plus delivery time.

The direct link from customers to growers gives Calyx and Corolla its competitive edge.

The growers that supply Calyx and Corolla have on-site PCs running custom software. With them, the growers interpret order information downloaded via dial-up modem from Calyx and Corolla's order-entry system from AT&T Global Information Solutions. When a customer orders flowers from the company, the order is assigned a six-digit order number and a 10-digit Federal Express Corp. airbill number taken from a bank of numbers Fedex gives Calyx and Corolla.

At the grower, the on-site PCs interpret the Fedex order information and print out a flower order, along with a peel-off custom Calyx and Corolla shipping label that includes a Fedex bar code. The bar code contains the shipping information; the order itself lets the grower know what type of flower, vase, card and message to include in the package.

Once the order and labels are printed, the flowers go in the box, the label goes on the outside, and the flowers are on their way. There is no Fedex paperwork done at the grower level — a big selling point in attracting growers, some of whom run very low-tech operations.

"Some of our growers were very large and sophisticated operations, and others were mom and pops for whom getting a fax machine was a big thing," says Fran Wilson, vice president of operations at Calyx and Corolla. "We were very patient and spent a lot of time teaching them how to use the software."

In the end, the system allowed Calyx and Corolla to roll out a couple more customer service benefits (besides fresher flowers faster). First, since growers have gained confidence in the computer system, they have begun faxing and telephoning information to Calyx and Corolla about surplus flower types or colors.

Order-takers at Calyx and Corolla's headquarters key the information into the system, and the surplus flowers appear as a daily special on the screens of all customer service representatives. The other important customer service enabled by the system is exact order-tracking through Calyx and Corolla's partnership with Fedex.

"We can always [track] our flowers within the Fedex system to find out if they are in the hub, on the truck or have already been picked up," Wilson says. "You wouldn't believe how many nervous sons and daughters there are out there the week before Mother's Day."

### Satisfaction guaranteed

Ordering merchandise through the mail can be an anxiety-provoking way to shop. What if it doesn't fit? What if the product doesn't look as good in real life as it did in the catalog? What if my spouse hates it? The answer is simple — return it.

But how?

While other companies have focused almost exclusively on the front end of the mail-order transaction, Spiegel has spent a considerable amount of time on the other end, looking at what happens after a sale goes sour.

As a result, Spiegel has reworked its returns service into a one-call transaction. By tweaking its mainframe software and cutting a deal with United Parcel Service, Inc., Spiegel can offer customers faster no-hassle service.

Customers who want to return merchandise make a phone call to Spiegel's UPS Call Tag Pickup Program, then attach a designated five-

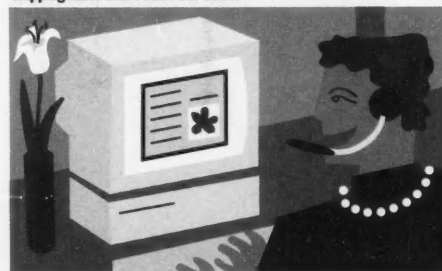
## FROM CUTTING TO CUSTOMER

CALYX AND COROLLA GUARANTEES NEXT-DAY DELIVERY

Customer orders flowers.



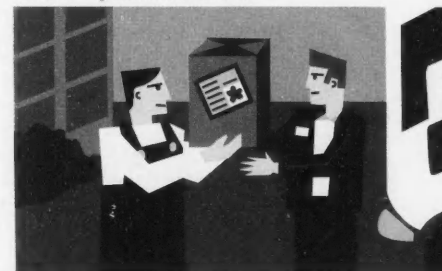
Calyx and Corolla assigns six-digit order number and 10-digit Fedex airbill number. Also provides peel-off shipping label with Fedex bar code.



Grower's PC interprets Fedex and order information. Prints out flower order including type, vase, card and message.



Flowers are boxed with label applied and sent out to customer, guaranteed to arrive the day after flowers were cut.





digit Call Tag number to the package. UPS will tell the customer when it will pick up the package within two days. If that's not convenient, UPS will pick up at the customer's place of work or even a neighbor's house.

At no time does the customer have to arrange for package delivery or pay reimbursable delivery charges.

For mail-order vendors throughout the retail industry, customer concerns about return policies and expectations of return hassles can be a big impediment to sales, according to VanGuard Communications' Taggart.

"People are really afraid they are going to get a hard time about returning things to mail-order retailers," Taggart says. "They are also afraid the whole process is going to be a big pain in the neck. Spiegel's service removes a lot of that squeamishness."

## Easy returns

According to Sheldon Pike, manager of quality at Spiegel, the UPS Call Tag Pickup Program works like this: When customers purchase merchandise from Spiegel, they are issued a returns number, or Call Tag, that is printed on the bill of sale.

To return an item, the customer dials a telephone number for returns in the (404) area code and gives the order and Call Tag numbers from the bill of sale via voice-mail prompts or a customer satisfaction representative.

Each night, Call Tag and customer address information is pulled from the Spiegel database and put onto a tape that is sent to a central UPS location in Chicago. UPS takes the tape, loads it onto its mainframe and distributes the pickup information to the appropriate UPS facilities across the country.

The package pickups are printed out and included with each driver's pickup orders. When the drivers pick up the packages, all they need to do is scan in the Call Tags already attached to the packages.

The Call Tag number on each package contains bar-coded information about which of the two return facilities in the Chicago area the merchandise will be delivered to: the wearing apparel and soft goods warehouse or the warehouse for appliances and other hard goods.

"This really adds convenience to what was already a free service," Pike says. "And a lot of the market research we've done indicates this is one of the advantages the customer is looking for — not only ease of ordering but also ease of returning."

## 'Win-win' mail-order support

Some companies in the direct-to-the-home or direct market industry do not have back-end systems or even distribution partners for returns. For example, third-party PC technical support services companies deliver their product, which is the technical support and advice of their experts, directly over the telephone.

All told, the market for business and consumer mail-order services accounts for \$56 billion of the total \$220 billion

mail-order market, according to Marketing Logistics, Inc., a Highland Park, Ill., publisher and consultant in the direct marketing industry.

Like direct-mail catalog companies, direct-mail services companies must provide customer service representa-

**Throughout this diverse industry, one thing is clear: A company does not need cutting-edge technology to support customer service as much as it needs to clearly apply existing IS technology to a customer service application that can differentiate it from the competition.**

tives with customer history information from their databases and route incoming calls to the appropriate personnel. The efficacy of the system is judged the same way by mail-order product or services vendors: time per call and customer satisfaction (which is tied to time per call and first-time fix rates).

"The only thing I needed to keep in mind for us to be an effective and profitable company was the idea that time is money," says Joe Jacoboni, president and founder of Software Support, which supports more than 125 PC applications. "Time is money for us and also for the end user."

## Reaching the experts

In putting together his business plan in 1990, Jacoboni drew on his own frustrating experience as a technical support user. His frustrations centered on the in-

convenience and wasted time involved in end users' relaying systems configuration information and getting bounced up the ladder several steps from an inexperienced service representative to an expert.

The company's early studies found that 40% of customer service calls were routed higher up, which angered customers who wanted a quick response.

Like all entrepreneurs, Jacoboni thought he could do better. He began researching technical service providers and noticed that the first few minutes of most technical calls were wasted explaining the setup of the system.

Even when companies attempted to gather configuration information in the first call, then store it for use in later calls, the information they got was almost always incomplete and often inaccurate, Jacoboni noticed.

His solution tweaked industry practices in two ways: He designed a profiler disk that copies the configuration of a PC — software installed, version numbers, hardware configuration, peripherals; and he reversed the standard call-routing process so callers begin with an expert and de-escalate down the ladder. With an expert as the first contact, de-escalation will certainly be less frequent than escalation, Jacoboni reasoned.

When a customer signs up for support, Software Support sends out a profiler disk for each PC. The customer loads the disk and sends it back, and then Software Support uploads the information to its database.

Each time the customer calls for support, the full system configuration is automatically routed to the Software Support person answering the call, along with such information as repair history, previous questions, recommended fixes and resolutions.

"Any time you can automate the process of what [hardware and software]

specific users have installed, you're going to save time and are going to increase customer satisfaction," says Bob Johnson, associate director/senior industry analyst of software services at Dataquest, Inc. in Framingham, Mass.

Automating the gathering of system configuration information is increasingly important in the client/server, LAN and distributed computing world, where system operators (and users, for that matter) easily lose track of PC hardware and software configuration.

"A distributed desktop environment can be a support nightmare because users all have different configurations and software versions," says Kurt Johnson, program manager of software services research at International Data Corp. in Framingham, Mass.

"Things like the profiler disk make it easier for both sides to get on the same page and really creates a win-win situation," Johnson says.

## One ID does it all

The tweak to the call-escalation procedure was designed to improve first-time responses to customer inquiries and, in the process, increase customer satisfaction. Every time customers call Software Support, they punch in an identification number and are led through prompts that pinpoint the nature of the problem (software/hardware; application/operating system).

Using the ID number, the system pulls up the configuration information (originally gathered with the profiler disk), goes to a lookup table to see the hierarchy of experts on that particular hardware or software configuration and routes the call to the top available expert of the hierarchy.

Because Software Support offers third-party technical support for 125 PC software packages, it is important for the company to route the call to the appropriate expert first.

With this expert-first procedure, Jacoboni claims to have virtually eliminated annoying call escalation that wastes time and erodes customer goodwill.

At the same time, each time a customer calls, a reference number is issued. If the fix does not work, the customer can call back and, via a voice-response system, enter the reference number to get routed to the same customer service representative who answered the original call.

Again, the goal is to improve customer convenience by reducing the amount of redundant information being passed from customer to service representative.

"Software Support is avoiding what I call the 'Tag, you're it' syndrome in technical support, where too often complex problems always have to start with entry-level service personnel and get handed off up the ladder until they get to an expert," Johnson says.

"The last thing customers want to do is repeat a question or talk to someone in technical support less skilled than they are," he adds.

Panepinto is a free-lance writer in Amherst, Mass.

## MAKING RETURNS EASY

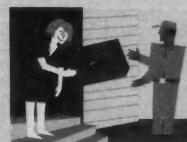
SPIEGEL FOCUSES ON THE RETURN  
END OF THE SALE



• When a customer makes a purchase, an order number and returns number (call tag) is printed on the invoice.



• To return the merchandise, a customer calls and gives the order number and call tag number.



• Each night, all call tag and customer information is retrieved from the Spiegel database and sent to UPS in Chicago.

• UPS distributes the pickup information to the appropriate local UPS facility.

• Package pickup orders are printed out and given to drivers with their regular routes.

• An item is picked up at the customer's home, office or other prearranged site.



# Giving computer users a Hand

**C**arpal tunnel syndrome, tendonitis and other repetitive stress injuries are epidemic among computer users, but help has arrived with publication of *The Hand Book*.

Author Stephanie Brown has identified a direct link between incorrect, strained finger and hand positions at the keyboard and subsequent injury. *The Hand Book* contains a new method for both the prevention of repetitive stress injuries and the retraining of those already injured.

Studies by the National Institute for Occupational Safety and Health show that more than 20% of employees who work primarily at a computer keyboard are affected by repetitive stress injuries.

*The Hand Book* offers advice to computer users on how to prevent injuries caused by hazardous hand positions such as the Dangerous Angle, the Cobra and the Spider (see photos). Keyboard users are shown more comfortable and relaxed positions by working through a series of 14 easy-to-follow lessons.

Brown, a concert pianist, started developing the principles described in her book 10 years ago.

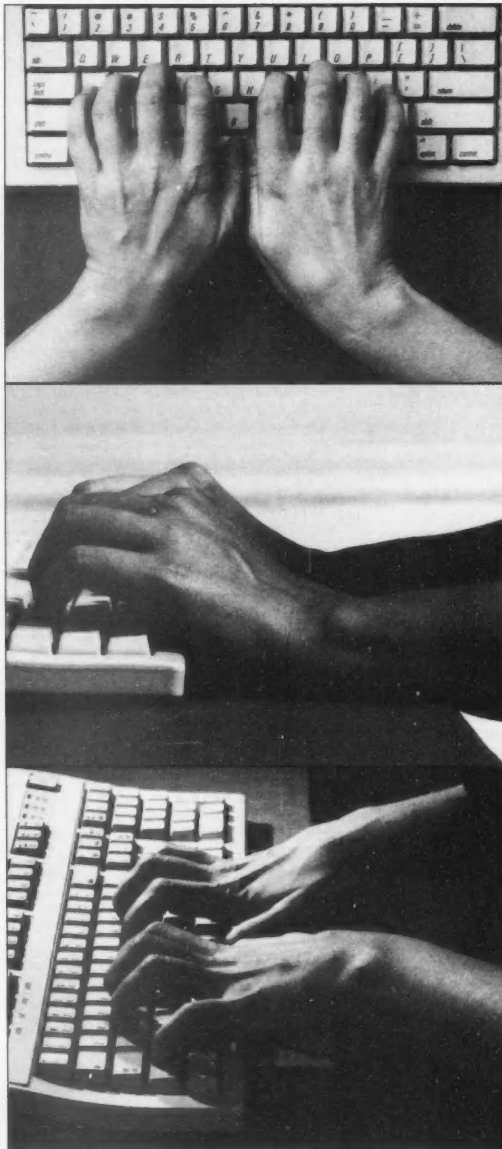
"It's well-known that certain positions and motions can cause injury in practically every sport," she says. "Everyone has had the experience of watching someone swinging a tennis racket or golf club and thinking 'Ouch!' It just looks wrong. Using a computer keyboard is no different. It's a vigorous, microathletic workout for the hands and fingers. Do it wrong, and you're asking for trouble."

*The Hand Book* contains 88 wrong-way/right-way photographs, 20 of which are included in a workstation poster, "The 12 Golden Rules for Safe Keyboard Use," which is packaged with every copy of the book.

It is published by Ergonomic, Inc. in New York.

Source: IDG News Service

*The Hand Book shows computer users how to avoid harmful hand positions: the Dangerous Angle, the Cobra and the Spider (top to bottom)*



## 'Virtual crowds' add dimension to emergency simulations

By Elizabeth Heichler

Architects and civil engineers in London will soon be able to evaluate safety aspects of building designs by populating a virtual reality model with a crowd and seeing how they react in an emergency.

Colt Virtual Reality Ltd. in Havant, England, was spun off in September from Colt International Ltd., a manufacturer of smoke ventilation, environmental control systems and other building products.

The firm has taken its experience in modeling smoke, fire and the behavior of people in emergency situations to create a virtual reality package called Vegas that architects can use to run "what-if" simulations on building designs.

Colt Virtual Reality transforms customers' computer-aided design models into virtual reality models with Vegas crowd and fire features.

The company is planning a new product for release this summer—Vegas 2—that will provide a library of people that can be loaded into any virtual world created using Dimension Ltd.'s Superscape virtual reality modeling software.

"You can pop in whatever kind of population you want—family groups, little old ladies, people in wheelchairs," company representative John Kendrick said.

The behavioral data comes from psychological studies of how different people move and react in emergencies—parents looking for their children, people panicking or even the brave or curious moving toward the source of a fire rather than away from it.

Random elements are also incorporated into the simulation, which runs in real time on a PC. While 486-based PCs can handle simulations with about 250 people, Colt Virtual Reality hopes to run simulations with up to 25,000 people on an Intel Corp. Pentium system.

The same simulation sequence is run as many as 100 times to gain an accurate evacuation time for a design; then the architect or engineer changes the design and reruns the simulation to see whether evacuation time can be shortened.

Kendrick said Vegas users can also switch to the point of view of any of the virtual characters in the emergency simulation to understand what they see and hear what they hear. Fire modeling routines using computational fluid dynamics add to the accuracy of the simulation.

Vegas has been used in London's planned Crossrail project by British Rail and London Underground to evaluate station designs for regular use and in emergency situations, according to Colt Virtual Reality.

Heichler is a London correspondent at the IDG News Service.



## Intelligence

### File

#### Calls for papers

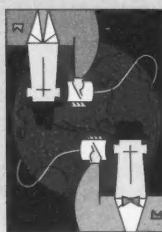
Readers with an itch to write may want to answer one of two calls for papers that have been issued. The International Institute of Communications, in conjunction with Inmarsat, has launched its second annual essay competition: The



InterMedia Prize 1994.

The essay theme for this year is "Leveling the playing field: Setting the agenda for a global communications commission." Essays should address whether there should be an international agency established to set regulations for global communications and what that agency would do.

Essays should be no more than 6,000 words in length and must be submitted by June 1 to Patricia Thomas, The Insti-



tute of Communications, Tavistock House South, Tavistock Square, London WC1H 9LF, England. The award will be given at the IIC Annual Conference Sept. 6-9.

Papers are also being invited for a symposium on "Tools for Corrosion Intelligence," sponsored by the American Society for Testing and Materials Committee G-1 on Corrosion of Metals. The symposium will be held May 15-16 in Denver and will

focus on the needs and goals of tools for better corrosion intelligence.

Papers should emphasize the efficient use of these tools for corrosion control and prevention: relational databases, expert system shells, hypertext and hypermedia environments, case-based reasoning, pen-point information gathering, fuzzy logic, adaptable user interfaces and semantic nets.

Papers should be 250 to 300 words in length and must be submitted by April 15 to Dorothy Savini, Symposia Operations, ASTM, 1916 Race St., Philadelphia, Pa. 19103-1187.

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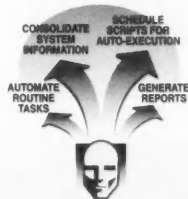
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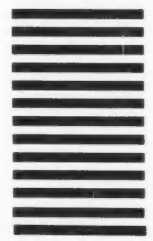
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# Calendar

## MARCH 13-19

**The Banca 5th Annual Executive Conference.** Dallas, March 13-15 — Contact: Banca, Dallas, Texas (214) 788-0018.

**1994 International Integrated Manufacturing Show & Conference.** New York, March 14-17 — Contact: Manufacturing Execution Systems Association, Pittsburgh, Pa. (412) 781-9511.

**Software Development Conference & Exposition.** San Jose, Calif., March 14-18 — Contact: Software Development Business Software Solutions, San Francisco, Calif. (415) 905-8120.

**Re-engineering: The Implementation Perspective.** Boston, March 15-17 — An educational seminar that will provide an introduction to the concepts and objectives of re-engineering. Instructor will be Michael Hammer. Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

**PC Marketplace '94.** San Francisco, March 17-18 — Contact: Lara Halbert, CMC, Norwalk, Conn. (203) 852-0500.

**Planning and Implementing Self-Directed Work Teams.** Phoenix, March 17-18 — Contact: Association for Manufacturing Excellence, Wheeling, Ill. (708) 520-0163.

## MARCH 20-26

**Shaping the Future of Corporate Finance.** Palm Springs, Calif., March 20-22 — Contact: American Financial Association, Boston, Mass. (617) 345-9700, Ext. 118.

**1994 Platforms for Communication Forum.** Phoenix, March 20-23 — Focus: Design of on-line videoconferencing salons, role of traditional entertainment companies in the world of "convergence" and impact of government agencies and policies. Contact: Daphne Kis, EDventure Holdings, Inc., New York, N.Y. (212) 924-8800.

**"Focus on Operations."** Atlanta, March 20-24 — Keynote speaker will be Larry Csonka. Contact: AFCOM, Orange, Calif. (714) 997-7966.

**FOSE '94. America's Information Technology Forum.** Washington, March 21-24 — Contact: Rosanne Desmone, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

**Common Spring Conference 1994.** Anaheim, Calif. March 21-25 — Contact: Monika Paus, Common, Chicago, Ill. (312) 644-6610.

**Uniform '94.** San Francisco, March 21-25 — Contact: IDG World Expo, Framingham, Mass. (508) 879-6700.

**Seybold Seminars '94.** Boston, March 22-25 — Contact: Seybold Seminars, San Mateo, Calif. (415) 578-8900.

## MARCH 27-APRIL 2

**LAN Security.** Washington, March 28-29 — Contact: Computer Security Institute, San Francisco, Calif. (415) 905-2826.

**Lap & Palmtop '94.** New York, March 29-30 —

Focus: Mobile Computing. The contact is Laptop Expositions, New York, N.Y. (212) 682-7968.

## APRIL 3-9

**EDI 2000.** Chicago, April 5-6 — Contact: EDI 2000, Dallas, Texas (214) 475-1838.

**The Virtual Reality Forum 1994.** New York, April 5-7 — Contact: Virtual Reality Systems, New York, N.Y. (212) 861-0588.

**15th Annual Conference on IS Performance/Capacity Management.** Phoenix, April 5-8 — Contact: The Institute for Computer Capacity Management, Phoenix, Ariz. (602) 997-7374.

## APRIL 10-16

**1994 KnowledgeWare International User Confer-**

**ence.** April 10-13 — Contact: KnowledgeWare, Inc., Atlanta, Ga. (404) 231-8575.

**1994 NASIRE Midyear Summit.** Boston, April 11-13 — The focus will be on National/Federal/State Issues. Contact: NASIRE (606) 231-1905.

**Managing Customer Service.** Phoenix, April 11-13 — Contact: The Institute for Computer Capacity Management, Inc., Phoenix, Ariz. (602) 997-7374.



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Thursday, March 31, 1994  
San Jose, CA  
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## Directions '94 Agenda

### 9:00 - 12:20 General Sessions

- ◆ Industry Dynamics - The IDC Perspective
- ◆ Annual Global IT Spending Survey Results
- ◆ Industry Competition
- ◆ Digital Media Convergence

1:40-2:15

2:20-2:55

3:20-4:00

4:30-4:40

### TRACK 1 - PERSONAL SYSTEMS

Opportunities and  
Dynamics in the Worldwide  
PC Systems Marketplace

Burning Down the House:  
PC System Software  
Technology Changes  
Fan the Flames

Positioning for Profit  
in the PC Mass Market

Channels in the Year  
2000: A Blueprint for  
PC Distribution

### TRACK 2 - SOFTWARE/SERVICES

Outlook for the Service  
Industry: The Planning,  
Implementation, and  
Management of IT Solutions

Revolutionizing IS  
Through Business  
Process Reengineering

Software Bundling:  
Here Today ...

Software Roadmap: Winning  
Product and Business  
Strategies for the '90s

### TRACK 3 - SYSTEMS

The Workstation Industry: A  
Market Under Turmoil

The Off-the-Shelf System:  
Building Real Midrange  
Systems Out of  
Commodity Components

As Unix and NT Square Off,  
The Battle for API Escalates

Systems Evolution in the  
Client/Server Computing  
Environment

### TRACK 4 - COMMUNICATIONS

Optimizing Investments in  
Communications Technology

Local Area Networks  
and the Deployment of  
Distributed Applications

Opportunities in Network  
Systems Management

Opening the  
Telecommunications  
Markets

### TRACK 5 - GLOBAL MARKETS

Distribution Strategies  
for Europe

Distribution Strategies for  
Latin America

Distribution Strategies  
for the Asia/Pacific Region

Global Industry Competition,  
1994-2000

### TRACK 6 - IS MANAGEMENT STRATEGIES

Leading IS in an Era of  
Change: The Right Choices  
for the '90s and Beyond

Client/Server Development:  
Are You Creating the Next  
Generation of Legacy  
Systems?

The New Networks: Building  
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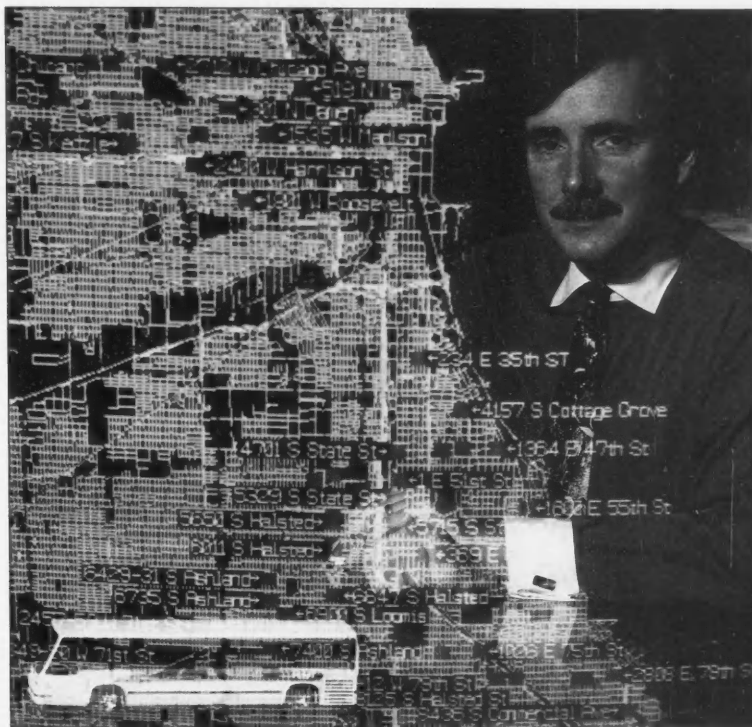
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# In Depth

Enticed by data costs that have plunged nearly 90% since the 1980s, companies are embracing **BUSINESS MAPPING** to find new customers and increase sales.



GATEWAY'S CRAIG HEARD: WITH BUSINESS MAPPING, HIS BILLBOARD COMPANY HAS BEEN ABLE TO FIND NEW ADVERTISERS AND, AS A RESULT, HAS INCREASED SALES BY 600%.

## IT'S NOT just a pretty picture

**DECLINING PRICES** and an increase in off-the-shelf reference data are making commercial companies look twice at an emerging subset of geographic information systems (GIS) known as business mapping. Their goal? To use this data to track and respond more quickly to business opportunities that include analyzing buying patterns, finding new customers, defining sales territories and selecting new business sites.

Business mapping, in fact, is the fastest growing sector of the GIS market, according to Dataquest, Inc. in San Jose, Calif. Mapping software sales jumped from \$25 million in 1992 to a projected \$42 million in 1993. The company forecasts 1997 sales will hit \$174 million.

The surge in business use can be traced to plunging data costs, which have come down as much as 90% from the 1980s, due to the influx of new data suppliers into the business market.

All this has been a boon for business users. Craig Heard, president of Gateway Outdoor Advertising, can replicate for \$25,000 today a demographic database management system that cost him \$750,000 to implement in the early 1980s.

"You can buy census tracts for the country for \$4,500 to \$5,000," Heard says.

With little more than a PC and mapping software, the companies on the following page literally have the world (or the country, or the neighborhood or the street) at their fingertips.

BY DAVID FORREST



## abc/satellite music network



- FINDING new markets
- POSITIONING stations in local markets
- HELPING advertisers find new customers
- DEVELOPING promotions

**F**or a lot of radio station owners, mapping can make the difference between making money and losing the shirts off their backs," says June Barnes, director of research at ABC/Satellite Music Network in Dallas.

The company, a subsidiary of \$5.3 billion Capital Cities/ABC, Inc. and a division of ABC Radio Networks, uses Compass market analysis software from Claritas Corp. in Alexandria, Va., to analyze demographic data and create maps for its 3,000 affiliates. These maps show affiliates where potential listeners for their various formats might be, such as "pure gold" (post-Beatles), "urban gold" (black oldies), oldies and country, among others.

Satellite Music has set up toll-free

numbers for each of its formats so listeners can call in to request a song, enter a contest or talk to a disc jockey. When they do, the company records their ZIP codes. It stores this data, along with the affiliate station's listener data and audience survey data from New York-based The Arbitron Co., in a large lifestyle database keyed to ZIP code.

Satellite Music provides this database information to affiliates on request so they can plan expansion into new markets and grab more audience share.

For instance, the company introduced its urban gold format into target markets last October after analyzing demographic and Arbitron data. Today, the new format is in use by more than 15 affiliates in such areas as Sacramento, Calif., Birmingham, Ala., and Indianapolis.

An affiliate station in New Orleans chose the "stardust" format (middle-of-the-road music for listeners over 35) after looking at demographics and lifestyles in the area. Currently, that station's advertising air time is sold out most of the time, and "it's one of the top billers in New Orleans," Barnes says.

### Ads, ads and more ads

Using audience data to attract advertisers is a key part of Satellite Music's strategy. "We can tell them how likely a pure gold listener is to buy a certain make of automobile," Barnes says.

A Colorado affiliate, for example, won the right to broadcast the state ski report when it used mapping to convince the state of Colorado that its listeners were avid skiers.

Barnes says this single application was worth about \$10,000 in new advertising for the station.

Satellite Music's system runs on an IBM PS/2 computer equipped with 8M bytes of memory, a CD-ROM drive, a 300M-byte hard disk and Hewlett-Packard Co. DraftPro DXL and Paintjet color plotters.

Barnes says the system, including data, costs \$45,000. The company also pays a software licensing fee of approximately \$45,000 yearly.

## gateway outdoor advertising



- PROFILING the neighborhood billboard audience
- FINDING new advertisers
- SELLING mapping services

**W**hile most billboard companies are hurting because of a prolonged recession and a decline in spending by tobacco firms, Gateway Outdoor Advertising is thriving. It is using desktop mapping to go after new clients in areas such as media, movies, retail and fast food.

The payoff has been a 600% increase in sales in these areas in the last 24 months, says Craig Heard, president of the \$13 million billboard company in Somerset, N.J.

Using desktop mapping for more than 2½ years has enabled Gateway to close an additional "million-plus dollars of business a year," Heard claims. The company has 12,000 neighborhood billboards throughout Pittsburgh, Miami, Cleve-

land, St. Louis, Detroit, Chicago and the Carolinas.

Heard's mapping system, which runs on a NEC Corp. 486-based computer with 600M bytes of disk storage, includes lifestyle, psychographic and media data from Mapinfo Corp. as well as demographic data from a local supplier.

One of the plums in Gateway's billboard fold is McDonald's Corp. The company signed up local restaurants for billboard advertising when it convinced advertising managers that it could target the customers they were trying to reach. Gateway produced maps comparing the location of billboards and restaurants.

As a result, Gateway says it sold the only neighborhood billboard advertising that McDonald's purchased in its recent national outdoor advertising campaign.

Gateway is now considering offering a mapping service to noncompeting billboard companies that don't have the resources or in-house expertise to do it themselves. Heard estimates the potential revenue from the service could be about \$100,000 a year.

### Define it for me

The basis of desktop mapping is cartographic and attribute data.

• **Cartographic data** provides the required map reference—the street network or ZIP code, state, county and census area boundaries, for example.

• **Attribute data** is information the user wants to analyze—population demographics, consumer lifestyles, buying behavior and so on.

Mapping software links these two data types. Population data collected in the 1990 census, for example, can be tied geographically to census block groups representing several hundred households or to larger areas such as census tracts, counties and states.

## minnesota retail institute



- LOCATING retail sales
- FORECASTING sales
- ANALYZING trade areas
- ASSESSING competitive impact

**E**lliott Olson lives and breathes retail, and he's got customers—supermarkets, discount department stores, home centers—dying to know in which goldmine areas to put their stores.

Olson is president of the Minnesota Retail Institute, Inc. (MRI) in Bloomington, Minn. His \$2 million company performs consumer research and sales analysis for retail companies, helping them to select new locations by projecting the sales volumes for potential sites.

Automated mapping, he says, has cut two to three weeks from the time required to complete a typical retail analysis project, saving approximately one-third to one-half of his staff's time.

MRI contracted with a third-party developer to create a retail modeling system for its own use. The resulting Vortex system uses Mapinfo mapping software and demographic data and projects

sales for a new retail site based on the total sales potential of a market area minus any effects of competition.

MRI's retail analysts combine census block groups into larger geographic sectors based on the population distribution, the transportation network and barriers that could discourage a customer from making a trip to a store. Barriers include physical obstacles such as rivers and railway tracks and psychological deterrents such as high-crime areas.

The retail model allocates customers to the proposed and competing stores and forecasts sales volumes at a new site.

### Big-time buyers

MRI also uses data from point-of-sale systems and frequent shopper programs to analyze consumer purchases. Olson says the identifying information on frequent shopper cards that some retailers use helps the company link sales and

profitability data to customers' home addresses.

By locating geographically those customers likely to spend money, stores can more effectively target promotional activities, such as mass mailings.

When a competing store opens up, Olson says, retailers can map sales activity to immediately pinpoint in which areas they're losing customers.

MRI also uses its modeling system to forecast the effects of retail competition. "Suppose we know that a new competitor is going to come into the marketplace," Olson says, "and two other stores are going to remodel. We can put those into the system to see how they are going to affect a store's sales."

Most of the time, he says, the system can project retail sales within 10%.

Forrest is a free-lance writer and management consultant at DMR Group, Inc. in Victoria, British Columbia.

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(a) Solaris (e) Mac OS  
(b) Netware (f) Windows NT  
(c) OS/2 (g) Windows  
(d) Unix (h) NeXTstep  
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13. Treasurer, Controller, Financial Officer

- DEPARTMENTAL MANAGEMENT**  
51. Sales & Mktg. Management  
70. Medical, Legal, Accounting Mgt.  
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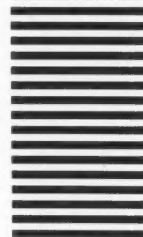
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\*The Computerworld Object Application Awards entry kit contains all details, rules and qualifications for this contest.

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# Computer Careers

## All the right moves

By Lance B. Eliot

*Don't expect to spend years in one position and be rewarded for it; the system no longer works that way. Recruiters and top information systems managers say successful middle-level managers make numerous lateral moves.*

Mike Brown, 37, a middle manager at Paramount Pictures in Hollywood, has taken this route. Brown has pursued an IS career since 1981 and has held seven positions since then, four at the middle-management level, and has changed industries twice. He reflects on his career:



BROWN

### WHAT IS THE KEY TO YOUR SUCCESS?

Keeping my eye on the prize. My career movement has been shaped by my desire to move into management and eventually rise to the highest executive IS position. I continually ask myself how each task or experience will ultimately contribute to my goal.

• Don't let your ego get in the way. Past successes do not guarantee present ones.

• Be willing to make lateral moves. Insist only on upward movement and you may be blocked.

• Find a mentor. He can assess skills and ambitions and help you expand beyond the technical side of IS.

• Do not overly criticize past career moves. Learn from them.

• Be ready for opportunity. Research different jobs and industries, establish a network of contacts and keep track of all new experiences and skills.

TACTICS & TECHNIQUES

### YOUR CAREER PATH HAS INVOLVED BOTH UPWARD AND LATERAL MOVEMENT. WAS THIS NECESSARY?

Yes. I started out as a systems analyst at Xerox Corp., and I gradually moved into management. After eight years, I realized I needed experience in other industries and made a somewhat lateral move into a position at PacificCare Health Systems in Cerritos, Calif.

### WHY DID YOU CHOOSE THE HEALTH CARE INDUSTRY?

I used data from the local chamber of commerce to determine that health care and entertainment were the most promising industries in Southern California. I purposely stayed away from defense and government. To get into this hot industry, I took an equivalent job, remaining in the middle-level ranks.

### YOU STARTED AS A SYSTEMS ANALYST IN DEVELOPMENT, THEN MOVED INTO THE NETWORK AREA AND THEN BACK TO DEVELOPMENT. WHY?

The shift has been intentional. Most management gurus urge firms to become more team-oriented, and the more areas an IS professional understands, the better team member he will be.

When I took the job at PacificCare, I managed the development and maintenance of billing systems that were essential to the company. I was forced to understand the business, IS customers and the technologies needed to keep those systems running. That's where every middle manager should strive to be.

### WHAT PROMPTED YOU TO CHANGE INDUSTRIES AGAIN?

I was involved in the adoption of computer-aided software engineering (CASE) tools, and I heard Walt Disney Imagineering was also moving into CASE and client/server technologies. When the opportunity arose, I decided to leap over to the entertainment industry.

### WERE YOU CONCERNED THAT TOO MANY JOBS IN A SHORT TIME MIGHT BE A CONCERN FOR HIRING MANAGERS?

Not really. Progressive, upper-level IS managers are used to rapid movement as long as it involves a sensible path. As a manager, I am surprised when people cannot tie their job progression together. Hiring managers want to know that individuals have put some thought into their career moves, and they expect to hear more than a job history. If candidates don't seem to care about their own job history, why should a hiring manager?

### ARE YOU FRUSTRATED BY THE SLOWER PROGRESS TOWARD A TOP IS SPOT THAN MIGHT HAVE BEEN IMPLIED WHEN YOU BEGAN YOUR CAREER?

Yes and no. You always read about hot-shot MBAs who want to run a company overnight. I take a more gradual and persistent approach. I enjoy being in this profession, and I feel good that my strategy seems to be paying off.

Eliot is president of Eliot & Associates, an information technology consulting firm in Huntington Beach, Calif.

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# BUZZwords

**As an IS professional, your interaction with automatic call distribution systems might be limited, but you should stay current with basic telephony jargon**

By Joe Panepinto

**A**t one time, the merger of telecommunications and information systems and services was important only in large call centers with huge phone banks supporting catalog companies, mail-order houses and telephone hot lines. Not anymore.

"This kind of integrated system is necessary for anyone with a customer service need," says Greg Borton, president of Nabnasset Corp., a systems integrator in Littleton, Mass. "That includes manufacturers, finance, banking and publishing."

Programmers who want to be on the bleeding edge of applications development can wade into computer telephone integration (CTI) development.

## Telephony relay

A host of applications fall into the CTI rubric, but the most common are those linking incoming calls to database information. In this system, an automatic call distributor (ACD) takes the call from an on-site private branch exchange (PBX) and routes it to the appropriate telephone headset. At the same time, a custom software application recognizes the incoming number via a dialed number identification service, matches the number to a customer profile in the company's database and routes the information to the same workstation. Ideally, the

call and the information show up simultaneously.

But there is a catch. Because there is still a host of competing application programming interfaces in the telephony world for host-PBX, PBX-network and application-ACD connections, writing the applications is almost always a custom job.

For instance, when Joe Jacoboni, president of Software Support, Inc. in Heathrow, Fla., needed this kind of application to run over a Novell, Inc. NetWare 3.11 network of Windows-based systems, it took him six months to write the software. The customer profile is written in Visual Basic; the router application that decides which workstation will receive the call and information is written in C++.

There is a trend toward building shrink-wrapped CTI software, such as PhoneNotes from Simpact Associates, Inc. and Lotus Development Corp., but the lack of standards is hampering that effort.

"In the long run, from a career point of view, IS people would benefit from becoming telephone-smart at least in a general way," says Bob Panoff, vice president of new business development at Natural Microsystems Corp. in Natick, Mass.

That means learning new acronyms and concepts (see box). For a full-blown CTI application, software must be written at the PBX or ACD, as well as at the

host computer system.

Despite the increasing coziness of IS and telephone systems, in the short term, when ACDs or voice-response systems are brought into all but the smallest companies, the daily maintenance of the system generally falls to someone other than an IS manager or programmer.

skills and duties do not overlap significantly.

"When you look at what is going on in fine granularity, it is still different teams of people with different skills," says Charlie Cockerill, director of direct-access technology.

Borton agrees.



## \*IMPORTANT ACRONYMS TO KNOW

**ACD** — **automatic call distributor**: A switching system designed to queue and/or distribute a large volume of incoming calls to a group of attendants and the next available answering position.

**CTI** — **computer telephone integration**: Applications and/or systems that bring together telephony and computing.

**DNIS** — **dialed number identification service**: A service or function that recognizes the source of an incoming call, allowing intelligent call routing.

**ICD** — **incoming call distribution**: The distribution of incoming calls through attendants via a CTI system.

**PBX** — **private branch exchange**: A private phone system (switch) that is connected to the public telephone network and performs a variety of in-house routing and switching.

At United Services Automobile Association, a Houston-based insurance and investment management firm, voice and data services fall under the same business unit, but the company retains personnel with distinct operational skills. The data folks may be familiar with telephone concepts and vice versa, but their

"When all is said and done, you want someone to manage the call center system who knows the call center business," he says. "You most certainly don't want an engineer to do it."

Panepinto is a free-lance writer in Amherst, Mass.

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**PROGRAMMER/ANALYST** (Ref. #6394) to consult with clients to ascertain & define their business reqs. or problem areas & utilizing tech. expertise to provide solutions to clients' needs, incl. analyzing, designing, developing & implementing comp. software for clients' EDP sys. Duties incl: design & development of an integrated database sys. The responsibilities incl: user req. study, feasibility & tech. analysis, data modeling, sys. design, integration & implementation & sys. maintenance & CICS/DB2/COBOL. The following languages & languages will be used: IBM 3090, IBM PC, MS/DOS, MICROSOFT WINDOWS, EXCELATOR, MSWORD, MSVISA, CICS, DB2, TSO, COBOL, & SQL. EDUCATION & EXPERIENCE: Need Bachelor's in Computer Science, Engineering, Systems Analysis or its equivalent & 2 years experience in the job offered or 2 years experience in a related occupation such as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Consultant, Systems Engineer or Associate Systems Engineer. Will accept 3 years of college education plus 3 years of experience in the job offered or in the related occupation in lieu of the required education & experience. The related experience must include, in whole or in part, application design, CICS system support or maintenance, IBM 3090, MVS/ESA & REXX/CMS. Pay is \$42,000/yr. 40 hr/wk. 8:30 a.m. - 5:00 p.m.

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**PROGRAMMER/ANALYST** (Ref. #6394) to consult with clients to ascertain & define their business reqs. or problem areas & utilizing tech. expertise to provide solutions to clients' needs, incl. analyzing, designing, developing & implementing comp. software for clients' EDP sys. Duties incl: analysis, design & development of a large scale transportation sys. The responsibilities incl: process flow & data flow design, tech. support & overall design of application entry part of the sys., & meetings with users to gather reqs. The tech. support provided will be for design of application on an IBM 3090 machine with MVS/ESA operating sys. The following languages & languages will be used: IBM 3090, ES 9000 & 9370, VMS/ESA (ESA & 370 Features) & REXX/CMS. EDUCATION & EXPERIENCE: Need Bachelor's in Computer Science, Engineering, Systems Analysis or its equivalent & 2 years experience in the job offered or 2 years experience in a related occupation such as Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Consultant or Systems Engineer. Will accept 3 years of college education plus 3 years of experience in the job offered or in the related occupation in lieu of the required education & experience. The related experience must include, in whole or in part, software development & design & development; & using IBM computers, COBOL, REXX, CICS, PC-FOCUS, PC-FOCUS & PC-LINK. Pay is \$41,000/yr. 40 hr/wk. 8:30 a.m. - 5:00 p.m.

Please send resume to 7310 Woodward Ave., Rm 415, Detroit, MI 48202 & include Ref. # Employer Paid Ad.

**Software Engineer:** Represent software consulting firm in providing data-processing assistance to diversified clients in finan. & ed. institutions, public utilities, mfg., arch. & med. industries; analyze client business & operating procedures & computer systems; design & develop complex financial & manufacturing systems for tracking accounting functions (general ledger, accounts payable, inventory control, master scheduling, material planning requirements, & shop floor controls); install new systems & conform hardware & software environments to systems requirements; implement & test software programs; develop technical specifications; generate designs, code, test, & implement functions; work extensively in an IBM AS/400 platform, OS/400, SQL/400, C/400, & RPG/400 environment. \$36,000/yr. 40 hr/wk. BSCS or equiv Eng. degree & 1 yr. in job offer in software product development environ. Exp. or background must include at least 1 yr. exp. in IBM AS/400 platform using RPG/400 & CL/400 & 6 mos. in change management product development. Ed or exp. should include training in micro-processors & micro- & opto electronics. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of resume to: Illinois Department of Employment Security, 401 S. State St. - 3 South, Chicago, IL 60605, ATTN: Gordon Dolber, Ref. #V-L 11408-ND CALLS. An Employer Paid Ad. Job located Far-West Chicago suburb.

**Programmer/Analyst:** Programs, code, tests, debug, & integrate various software to be installed as part of an integrated personal computer package. Will use principles of data structures and database technology to modify software in Windows and DOS environment to support multimedia boards which are installed in personal computers to allow use of audio/visual equipment and recorders such as video cassette recorders and speakers. Will code in C++ and Visual Basic including source codes. Will write device drivers to insure hardware and software integration for purposes of adapting software to accommodate video capture, CD ROM, sound board, and video processing hardware. Requires Master's degree in Computer Science. Education to include completion of one course in Visual Computing; one course in Computer Systems Modeling; two courses in Database Technology; and, one course in Data Structures. 9:00 a.m. - 5:00 p.m. 40 hours per week at \$34,295.00 per year salary. Must have training in duplicate (no calls): Illinois Department of Employment Security, 401 S. State St. - 3 South, Chicago, IL 60605, ATTN: Pete Kula, Employer Paid Ad. An Employer Paid Ad.

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Data Processing

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**NATURAL/ADABAS SYSTEMS ANALYST:** Requires 4+ years programming experience. Desirable technical skills include: NATURAL/ADABAS, MVS, MVS/JCL and MVS utilities. Must have proven project management skills in developing and supporting billing applications.

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**LAN ADMINISTRATOR:** Requires 4+ years LAN administration experience. Required technical skills include: LAN and WAN, remote and local problem diagnosis, knowledge of PC hardware components and peripherals. Experience working with end users in a support role required. Must have the ability to work with vendors. Banyan Vines experience a plus.

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Systems Programmer (Houston, TX area client site). Design, install, program, test, and maintain SQL/DS database systems and IBM VM operating systems software. Bachelor's degree in Comp. Sci., Math, or Engineering, and 2 yrs. exp. in job req. 40 hrs/wk, 8:30-5, \$37,500/yr. Apply at the Texas Employment Commission, Houston, TX, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778, J.O. #TX894444. Ad Paid by an Equal Opportunity Employer.

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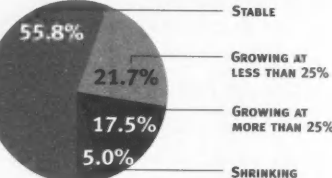
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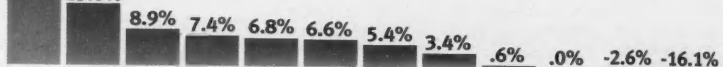
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**SURVEY CONDUCTED BETWEEN OCTOBER 1993 AND FEBRUARY 1994**

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**15.0%**



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15.0%	8.9%	7.4%	6.8%	6.6%	5.4%	3.4%	.6%	.0%	-2.6%	-16.1%		

**CORPTECH**, A DIRECTORY PUBLISHER IN WOBURN, MASS., TRACKS THE COUNTRY'S 35,000 TECHNOLOGY MANUFACTURERS. THIS SURVEY RELATES TO THE TRACKED FIRMS WITH FEWER THAN 1,000 EMPLOYEES.

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**"From some 600 responses generated by a recent Computerworld recruitment advertisement, we've already hired about 50 professionals who were direct replies -- and we're still hiring from that advertisement."**

Jason K. Whitehair  
Recruiting Manager/Systems Engineering  
MCI Telecommunications Corporation

Having just celebrated its 25th anniversary and exceeding \$10.6 billion in revenue, MCI is not only the nation's second largest long-distance provider, but also the world's fifth largest carrier of international traffic. Because the Systems Engineering Division plays a strategic role in shaping MCI's technological future, Recruiting Manager Jason Whitehair relies heavily on *Computerworld* to help recruit leading-edge professionals.

"Dedicated to delivering premier customer service and the highest quality products, Systems Engineering provides systems and software development and support to all of MCI's domestic and international voice and data businesses. Everything from message processing and commercial billing ... to network management and control ... to MCI Mail ... and more. Take our Friends & Family program, for example. Our software applications are what keep track of millions of 'calling circles' and generate customized bills.

"Not limited to any one platform, we utilize the platform best suited to deliver each customer service. So I'm always looking to recruit systems engineers with at least five to seven years of experience in a wide range of technical environments. Because *Computerworld* is one of the best trade publications for staying on technology's leading edge, its readers are the professionals we're generally looking to recruit. When it comes to recruitment advertising, *Computerworld* delivers a much higher ratio of qualified candidates than daily newspapers or nontechnical publications.

"The vast majority of resumes generated by our *Computerworld* recruitment advertise-

ments are from very high calibre candidates. We're typically able to use 350 out of every 400 resumes we receive -- and that's a hit rate of nearly 90%. In fact, from some 600 responses generated by a recent *Computerworld* recruitment advertisement, we've already hired about 50 professionals who were direct replies -- and we're still hiring from that advertisement. For a single advertising investment, we've more than gotten our money's worth.

"After Systems Engineering moved from Washington, D.C. to Colorado Springs back in 1991, our *Computerworld* recruitment advertising has been instrumental in helping us hire more engineers than usual -- and hire them fast. And, since I'm still seeing activity as a result of a recruitment advertisement we ran five months ago, I know we get sustainable impact with *Computerworld*.

"As MCI continues to expand into the long distance market including data transmission, 800 service, international calling, and Personal Communications Services (PCS), we'll continue to rely on *Computerworld* recruitment advertising to attract the hard-to-find, highly qualified technical people our global business demands."

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- Luis Navarro  
Vice President, Sales  
Faneuil Systems



Faneuil Systems of Chicago, formerly known as GIS Information Systems, has been providing outsourcing and remote computing services to a growing base of customers throughout the U.S. for over a decade. Positioning itself as "Your Best Choice for Mainframe Computer Services," this medium-sized provider is unique in that it supports all IBM mainframe architecture operating systems, yet can afford to do business with all sized companies - from the very smallest to those with large international operations. In order to successfully target organizations with specific mainframe requirements, Luis Navarro, Vice President of Sales, advertises in *Computerworld's Marketplace Pages* every week.

"In a broad sense, our target audience includes anyone with a mainframe on the floor. More specifically, Faneuil Systems targets two categories of potential customers: organizations looking to outsource their corporate data centers while transitioning to smaller platforms - and companies needing outside services to drive their mainframe-based applications. In either case, *Computerworld's Marketplace Pages* put us in touch with organizations that have specific mainframe criteria and are a good fit for our environment.

"It's my impression that *Computerworld* is the leading publication within the IS industry. Over the years its readers have come to expect the classified section to contain advertisements from providers of specific IS services - like Faneuil Systems. It's no surprise, then, that we experience a higher rate of closure with leads generated by *Computerworld's Marketplace Pages* than with leads from any other source.

"In our business, with thousands and thousands of data centers out there, the quantity of leads is far less important than the quality of leads. Because we consistently get very qualified prospects, we advertise in *Computerworld's Marketplace Pages* exclusively.

"And *Computerworld's Marketplace Pages* do more than generate high quality leads. It's also where we establish credibility over time by building name recognition and corporate visibility. Here, the credibility of *Computerworld* goes a long way in establishing our reputation as a solid industry player. This is extremely important, as our customers want to know that we're here today - and will be here in the future as well.

"We're also extremely pleased with the return on our advertising investment in *Computerworld's Marketplace Pages*. Qualified prospects are clearly getting the message about our strong entrepreneurial spirit, high level of service and support for a wide variety of software products, and total flexibility in tailoring mainframe services to individual customer requirements. Until I'm convinced that we can get better results elsewhere, Faneuil Systems will continue running weekly advertisements in the primary classified resource for IS - *Computerworld's Marketplace Pages*."

Computerworld's Marketplace Pages. It's where computer buyers meet computer sellers - every week. Just ask Luis Navarro of Faneuil Systems. To put your classified sales message into the hands of 505,000 influential buyers, call Connie Martin Kearins, Sales Director/Classified Advertising at 800/343-6474.

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# Marketplace

## Pssst - wanna buy a laptop?

By Julie Hart

Analysts will not venture a guess about black-market prices for portable computers, but if you find a laptop for 20% below the fair market value, says Robert Zises, executive director of the Stolen Computer Registry, it is probably hot.

Zises, who is also president of the National Computer Exchange in New York, says the Exchange carries used Apple Computer, Inc. PowerBook 180Cs for \$2,250 and IBM ThinkPad 700Cs for \$3,100. "Anything much less should raise your antenna," he says.

Although portables are easy targets, "less than half" of the companies that hand them out take security precautions, says John O'Leary, director of education at the Computer Security Institute in Plano, Texas. In fact, no one considers protecting a laptop until after it is stolen, Zises says.

Once your portable is gone, there is little chance of getting it back. Some vendors require the removal of serial numbers from refurbished hardware before resale. While this hardware is sold legitimately, a lot of other hardware without serial numbers is sold illegally.

One of these untraceable portables could be yours, especially if you own a PowerBook or ThinkPad. "The demand for these two portables, as well as any color notebook, is high," Zises says. As a result, they often end up on the black market.

If you can stand a little inconvenience, you can avoid being the next victim. One of the most common and least expensive security products is a cable/lock device that lets users secure their portable to a stationary item. "They definitely work as a deterrent against theft," O'Leary says, "but most cabling systems are bulky and inconvenient."

If employees use four-pound notebooks, and you ask them to carry around five pounds of security equipment, they're probably going to resist, O'Leary says. "And no matter how well-designed the security device is, it won't work if employees won't use it."

Sonic alarms are the second most popular security devices, analysts say. Similar to car alarms, these products have a piercing alarm loud enough to stop any criminal.

After a few false alarms, however, users often stop using them. "Sonic alarms are very effective," O'Leary says. "But if people have been embarrassed a couple of times, they avoid using it."

The fastest way to dispel employee resistance to security devices is through education.

"Once a company makes security a priority, employees begin to take it more seriously," O'Leary says. They may even begin to use security devices, regardless of the inconvenience.

Hart is a free-lance writer in Santa Barbara, Calif.



### CABLE/LOCK DEVICES



Secure-It's Kahlit Sentinel

**Kahlit Sentinel: \$49.95**

The Sentinel comprises a disk drive lock and a cable/lock device so users can protect their notebook and data. Works with most portables with a 3.5-in. drive.

**Secure-It, Inc.**  
(800) 451-7592

**Notebook Guardian Universal: \$39.95**

The locking device comprises a cable and an anchor plate that attaches via adhesive or via most notebook computers' built-in security slot or disk drive.

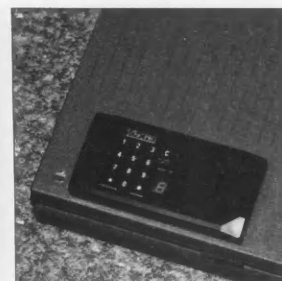
**PC Guardian**  
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**PowerLock Plus: \$49.95**

A 7-ounce device that locks portables closed and comes with a cable/lock device to anchor the portable to any stationary object. Works with most IBM compatibles.

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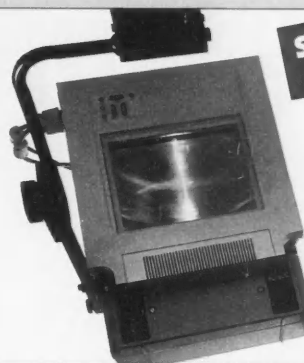
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#### 'Steep Learning Curve'

Those pressures leave little time for a new boss to master IBM's business. Fully 51% of IBM customers surveyed by *Computerworld* magazine say IBM needs to hire a CEO with a technology background. With Mr. Gerstner lacking such a pedigree, "he's going to be on a very, very steep learning curve," says David Hanna, a former IBM executive who is now president of Hanna Group, a computer-consulting firm.

THE WALL STREET JOURNAL

March 25th, 1993

#### Computers & Automation

"Information systems managers are grasping onto this as a Holy Grail," said Paul Gillin, executive editor of *Computerworld*, which is just one of many industry trade publications that spotlight reengineering on a regular basis. "It is an important leap for corporations."

The hype should reach crescendo in May, when a new book by management consultants Michael Hammer and James Champy will be titled "Reengineering the Revolution."

#### Investor's Business Daily

March 25th, 1993

EEK, THERE'S A MOUSE in the corner office. The percentage of executives who regularly use computers nearly doubled in four years, to 81% from 42% in 1989, says a study by *Computerworld* magazine and Andersen Consulting. Fewer than half think they are getting their money's worth from corporate computer systems.

THE WALL STREET JOURNAL

April 20th, 1993

their question:  
Where are the  
productivity  
savings?

The New York Times

April 25th, 1993

**C**ORPORATE executives appear to be more knowledgeable about computer technology than ever before, but they have also become more demanding and less forgiving, a new survey has found. While they believe information technologies are the key to competitive advantage, they also say that they have not been getting their money's worth.

The survey, conducted by the computer industry newspaper, *Computerworld* and Andersen Consulting, also found that 81 percent of top executives are personally using computers in their daily jobs, nearly double the percentage reported when the survey was first taken four years ago.

More than 200 chief executives, chief operating officers, and chief financial officers, representing a broad range of businesses, participated in the study, the results of which were published in *Computerworld* last week. Annual company sales ranged from \$250 million to \$20 billion.

The New York Times

March 25th, 1993

#### IBM CUSTOMERS HAVE THEIR SAY TOO

IBM directors should forget about hiring another salesguy to replace John Akers as CEO. And whoever he is, Akers' successor should fire a whole lot more people. So says a *Computerworld* survey of executives at 100 companies that spend at least half their computer budgets on IBM products. The participants, who work at the likes of Kmart and Parker Hannifin, a maker of pneumatic and hydraulic components, also said IBM's reorganization into smaller business units should go further.

*Computerworld*, in addition, interviewed various computer industry luminaries, including Steve Jobs. The Next CEO marveled that none of IBM's machines from mainframes to PC's uses the same software. Says Jobs: "IBM's troubles stem from the fact that they approach everything from a hardware strategy, and the Nineties is a software decade."

Not everybody agreed that breaking up is the way for IBM to go. Said Larry Ellison, CEO and co-founder of Oracle, a software company: "This is the

retired I.B.M. vice president.

A survey of some 100 of I.B.M.'s largest customers by *Computerworld* magazine found that 51 percent preferred someone with a technical background to be the computer giant's new chief executive, while 36 percent said technical expertise was not essential and 13 percent had no opinion.

But some industry experts say technology knowledge is a

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April 5th, 1993

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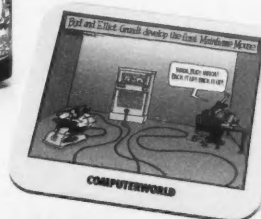
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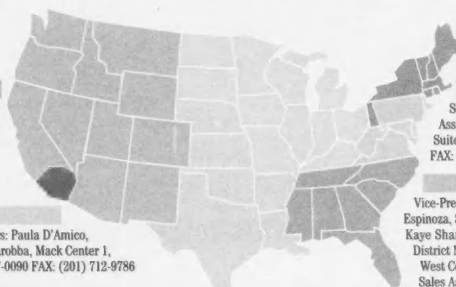
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Boxlight Corp.	(800) 762-5757
CSC Compusource	(919) 481-9841
Computer Site Tech., Inc.	(800) 226-0784
Dempsey Business System	(800) 888-2000
Elin Computer	(800) 363-5611
Executive InfoSource	(708) 215-9370
Faneuil Systems	(708) 574-3636
NetManage Inc.	(408) 973-7171
Spectra Equipment	(800) 745-1233
ValueStar	(800) 873-VALU

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# Friday Stock Ticker

## Gainers

### Percent

MICROPLUS CORP. (L)	28.2	AST RESEARCH INC.	-24.4
PHOTONIC TECHNOLOGIES	27.7	TAICORP SYSTEMS	-16.9
MAXTOR CORP.	20.9	FIBRONIX INT'L (L)	-12.1
WESTERN DIGITAL CORP. (H)	20.7	GANDOLF TECHNOLOGIES INC.	-11.1
STATE OF THE ART	18.9	TRINICORP	-9.5
LSI LOGIC CORP. (H)	17.9	DATA SWITCH CORP.	-9.4
SCIENTIFIC ATLANTA INC.	17.8		

### Dollar

MICRON TECHNOLOGY (H)	10.75	AST RESEARCH INC.	-7.75
CABLETRON SYSTEMS	8.50	ITT CORP.	-7.13
CISCO SYSTEMS INC.	6.00	INFORMATION RESOURCES	-6.25
CHIPCOM CORP.	5.25	MATSUMITA ELECTRONICS (H)	-4.50
SCIENTIFIC ATLANTA INC.	4.75	TAICORP SYSTEMS	-3.50
TEXAS INSTRUMENTS	4.75	3M CORP.	-2.50
STORAGE TECHNOLOGY	4.25	IMRS	-1.75
LOTUS DEVELOPMENT (H)	4.25	AT&T	-1.13

PC DRIVE IDE MANUFACTURERS WERE BIG WINNERS LAST WEEK, WITH WESTERN DIGITAL CORP. LEADING THE BUNCH WITH NEWS THAT IT WILL COMFORTABLY EXCEED EXPECTATIONS FOR FISCAL YEAR CLOSING. ON THE DOWN SIDE, AST RESEARCH INC. ANNOUNCED IT WILL SUFFER SHORTFALLS IN REVENUE AND EARNINGS (SEE STORY PAGE 30).

## Faint praise

PictureTel Corp. (PCTL) is getting something less than a ringing endorsement from stock analysts these days.

In the wake of disappointing fourth-quarter financial results from the Peabody, Mass., company, analysts at Montgomery Securities issued a report that rated PictureTel stock a Hold. Alex. Brown & Sons, Inc. issued a similar report reiterating a Neutral rating.

PictureTel has lost roughly half of its share price in the past year. Montgomery Securities analysts said the company, however, still has many advantages over its competitors: It is the largest dedicated videoconferencing company and the only one that has enjoyed continuous profitability. Fourth-quarter revenue grew about 13% year to year, to just under \$49 million.

Montgomery Securities noted that PictureTel continues to take market share away from smaller dedicated videoconferencing vendors.

The disadvantages include gross profit margins that have slipped and will likely continue to do so as PictureTel invests in developing low-end systems. In addition, Intel Corp. (INTC) numbers among the horde of challengers that have jumped into the low-end videoconferencing market.

The Montgomery Securities report indicated that PictureTel's long-term outlook is probably good, but the stock will face continued pressure in the near term.

PictureTel held a conference with investment analysts shortly after the quarterly financials were announced. The company indicated that it plans to deliver a software-only product that will provide video over standard Ethernet networks.

Montgomery Securities analysts said such a product, delivered by mid-1995, would be less expensive and more powerful than anything else available.

—Derek Slater

### Nothing to call home about

PictureTel and competitor Compression Labs have had a disappointing 12 months on the stock market

	March 5, 1993	June 4, 1993	Sept. 6, 1993	Dec. 3, 1993	March 2, 1994
PictureTel	24 1/2	22 1/2	17 3/8	20 3/4	14 1/2
Compression Labs	12 3/4	13	14 1/4	14 1/8	13

## EXCH 52-WK RANGE

COMMUNICATIONS AND NETWORK SERVICES

EXCH	52-WK RANGE	MAK. 4 3PM	WK NET	WK NET	CHG
OTC	63.25 19.63	3COM CORP.	57.63	-0.25	-0.4
NYS	45.56 35.50	AMERITECH CORP.	41.50	1.50	3.8
NYS	65.00 50.88	AT&T	50.88	-1.75	-3.3
NYS	26.50 12.50	BANYAN SYSTEMS INC.	16.38	-0.38	-2.9
NYS	69.13 50.75	BELL ATLANTIC CORP.	53.13	-1.25	-2.3
NYS	63.88 50.63	BELLSOUTH CORP.	55.25	-0.38	-0.7
NYS	17.00 4.25	BOLT, BERANEK & NEWMAN	16.13	1.13	0.8
OTC	16.25 9.50	BROOKTRUST TECHNOLOGY	14.75	-1.00	-6.3
NYS	130.00 76.50	CABLETRON SYSTEMS	130.00	8.50	7.0
OTC	63.50 14.50	CENTURYLINK COMMUNICATIONS (H)	25.25	1.00	2.5
OTC	57.00 27.50	CHIPCOM CORP.	54.50	5.25	10.7
OTC	18.38 8.00	CISCO SYSTEMS INC.	78.50	6.00	8.3
OTC	36.00 19.50	COMPRESSION LABS INC.	13.25	-0.25	-1.9
OTC	4.63 1.50	CROSSCOM	21.50	0.25	1.2
OTC	7.75 3.25	DIGITAL SYSTEMS INT'L INC. (L)	2.38	-0.25	-9.5
OTC	73.13 24.25	DSC COMMUNICATIONS	53.00	-0.63	-1.2
OTC	8.63 3.00	FIBRONIX INT'L INC. (L)	3.63	-0.50	-12.1
OTC	3.75 0.81	GANDOLF TECHNOLOGIES INC.	1.00	0.13	-11.1
OTC	2.06 0.69	GATEWAY COMMUNICATIONS	0.97	0.06	7.0
ASE	17.25 8.00	GENERAL DATACOM INC.	15.88	0.25	1.6
NYS	31.3 2.50	GO VIDEO	2.38	-0.13	-5.0
NYS	39.88 31.50	GTE CORP.	32.00	-1.25	-3.8
NYS	104.25 76.50	ITT CORP.	88.25	-7.13	-7.5
OTC	29.88 20.69	MCI COMMUNICATIONS CORP.	25.50	-0.75	-2.9
OTC	6.38 1.50	MICROCOM INC.	6.50	0.63	10.6
OTC	9.25 3.50	NETRIX CORP.	7.00	-0.38	-5.1
OTC	15.75 6.00	NETWORK COMPUTING DEVICES	39.13	-0.13	-0.3
OTC	11.13 5.38	NETWORK EQUIPMENT CORP.	23.00	2.88	14.3
OTC	23.00 8.00	NETWORK GENERAL	8.50	-0.13	-1.4
OTC	11.75 6.88	NETWORK SYSTEMS CORP.	10.63	0.63	2.1
NYS	23.88 22.50	NEWBRIDGE NETWORKS CORP.	24.75	-0.50	-2.0
NYS	46.00 21.38	NORTEL TELECOM LTD.	45.13	0.13	0.3
OTC	35.25 17.00	NOVELL INC.	27.50	-1.50	-5.2
NYS	48.88 36.63	PEPPER CORP.	13.00	0.50	-3.7
OTC	30.00 19.00	PCTEL COMMUNICATIONS CORP.	6.50	0.25	0.0
OTC	18.25 8.75	OPTICAL DATA SYSTEMS INC.	14.50	0.13	-0.9
OTC	7.13 3.75	PENNEL DATA COMM NETWORKS	6.50	0.25	0.0
OTC	27.25 13.50	PICTURETEL CORP.	14.50	0.13	-0.9
OTC	8.25 3.63	PROTEON INC.	6.50	-0.25	-3.7
NYS	38.88 21.13	SCIENTIFIC ATLANTA INC.	31.38	4.75	17.8
NYS	47.00 35.75	SOUTHWESTERN BELL CORP.	40.00	-0.13	-0.3
NYS	40.25 29.38	SPRINT CORP.	35.75	-1.25	-3.4
OTC	26.75 12.50	STANDARD MICROSYSTEMS CORP.	19.00	0.13	0.7
OTC	19.75 10.25	STRATACOM INC.	15.75	0.13	0.8
OTC	42.75 20.00	SYNOPSIS COMMUNICATIONS	25.00	-0.63	-2.4
OTC	12.75 2.88	TELEBIT CORP. (H)	12.75	1.75	15.9
OTC	43.50 18.25	US ROBOTICS INC.	40.00	0.25	0.6
NYS	50.75 39.00	US WEST INC. (L)	40.38	-0.25	-0.6
OTC	80.50 36.75	WELLFLEX COMMUNICATIONS (H)	79.25	2.88	3.8
OTC	26.38 7.25	XIRCOM	26.38	1.13	4.5
OTC	30.00 15.25	XYPLEX INC.	19.13	1.88	10.9

## PC AND WORKSTATIONS

EXCH	52-WK RANGE	MAK. 4 3PM	WK NET	WK NET	CHG
OTC	5.56 2.50	ADVANCED LOGIC RESEARCH	4.25	0.13	3.0
OTC	13.75 22.00	APPLE COMPUTER INC.	16.75	0.75	2.1
OTC	33.00 12.75	AST RESEARCH INC.	8.50	0.75	24.5
NYS	5.63 2.50	COMMODORE INT'L	3.38	0.25	8.0
NYS	101.88 43.13	COMPAG COMPUTER CORP. (H)	99.13	0.13	0.1
OTC	39.13 13.50	DELL COMPUTER CORP.	23.38	-0.88	-1.7
OTC	25.00 16.75	GATEWAY 2000 INC.	23.38	0.50	-2.1
NYS	93.63 64.38	HEWLETT PACKARD CO. (H)	89.88	-1.50	-1.6
NYS	75.00 11.75	IBM	88.88	3.88	3.5
OTC	36.00 21.13	SUN MICROSYSTEMS INC.	29.25	2.00	7.3
OTC	50.75 25.75	TANDY CORP.	41.38	-1.50	-3.5
OTC	5.63 2.50	ZEOS INTERNATIONAL LTD.	3.00	-0.25	-7.7

## Large Systems

EXCH	52-WK RANGE	MAK. 4 3PM	WK NET	WK NET	CHG
NYS	8.13 4.38	AMDAHL CORP.	5.75	0.50	8.3
NYS	7.25 3.63	CONVEX COMPUTER	6.50	0.50	8.3
NYS	32.25 20.38	CRAY COMPUTER	2.25	0.25	12.5
NYS	13.88 7.63	DATACORP INC.	8.25	0.25	3.1
NYS	48.25 27.75	DIGITAL EQUIPMENT CORP. (L)	31.00	1.88	6.4
NYS	52.25 33.88	HARRIS CORP.	50.75	0.13	0.2
NYS	60.00 40.63	IBM	52.63	-0.13	-0.2
OTC	25.75 3.38	KENDALL SQUARE RESEARCH (L)	5.13	0.38	7.9
OTC	37.13 22.25	MATSUMITA ELECTRONICS (H)	37.13	-0.25	-0.7
OTC	18.75 12.75	NETRAME	15.00	-0.63	-4.0
OTC	26.00 9.25	PARALLAN COMPUTER	10.50	0.50	5.0
OTC	23.25 11.25	PERMUTIT SYSTEMS INC.	13.75	0.50	3.6
OTC	23.25 11.25	SEQUENT COMPUTER SYS. (H)	14.13	-0.63	-4.2
OTC	6.50 1.75	SEQUENT SYSTEMS INC. (H)	6.50	0.50	8.3
NYS	25.75 20.75	SUN MICROSYSTEMS INC.	25.75	0.00	0.0
NYS	15.50 8.50	TANDY COMPUTERS INC. (H)	14.50	-0.38	-2.6
OTC	30.00 10.63	TRICORD SYSTEMS	17.25	-3.50	-16.9
NYS	15.25 9.88	UNISYS CORP.	13.88	-0.63	-4.3

## Software

EXCH	52-WK RANGE	MAK. 4 3PM	WK NET	WK NET	CHG
OTC	37.00 16.25	AUTOBASE SYSTEMS INC.	28.25	-1.00	-3.4
OTC	27.75 13.50	ALUS CORP.	23.13	1.13	5.1
OTC	8.88 5.13	AMERICAN SOFTWARE INC.	6.00	0.13	2.1
OTC	28.13 8.00	ASAT COMPUTER SYSTEMS	8.13	-0.25	-3.0
OTC	59.75 37.00	AUTODESK INC. (H)	59.50	1.50	2.6
OTC	4.50 2.38	BACHMAN INFO. SYSTEMS	3.38	0.13	3.8
OTC	41.00 24.00	BGS SYSTEMS INC.	24.00	-1.00	-4.0
OTC	70.00 38.75	BMC SOFTWARE INC. (H)	69.38	0.38	0.5
OTC	28.25 20.38	BOOLE & BAGGAGE	23.75	0.25	1.1
OTC	27.25 12.00	BORLAND INT'L INC.	13.38	0.75	5.9
OTC	4.63 2.75	CE SOFTWARE	3.00	0.00	0.0
ASE	42.25 18.50	CHEYENNE SOFTWARE INC. (H)	40.50	0.00	0.0
OTC	14.25 6.00	COMPU-QUEST INC.	11.63	0.88	8.1
NYS	44.88 21.88	COMPUTER ASSOCIATES	37.25	0.13	0.3
NYS	6.13 2.13	COMPUTATION SYSTEMS	4.00	0.00	0.0
OTC	37.25 19.25	COMPUWARE CORP. (H)	35.00	0.25	0.7
OTC	12.25 5.75	COMWARE INC.	10.50	0.00	0.0
OTC	22.00 6.81	COREL CORP.	20.25	1.25	6.6
OTC	11.25 3.38	EASEL CORP.	4.63	0.25	5.7
OTC	25.75 8.75	FILUNET INC.	10.75	0.00	0.0
OTC	25.00 10.75	ATM DIMENSION	11.50	-0.63	-5.2
OTC	14.25 5.25	FRAME TECHNOLOGY	8.50	-0.13	-1.4
OTC	15.50 7.00	GROUP SOFTWARE	9.00	0.00	0.0
OTC	37.13 13.50	GUPTA (H)	29.88	-1.00	-3.2
OTC	12.00 6.13	HOGAN SYSTEMS INC.	9.88	-0.13	-1.3
OTC	19.50 11.13	HYPERCOM INC.	10.50	-2.50	-9.4
OTC	44.75 22.75	INFORMATION RESOURCES	22.75	-5.25	-18.8
OTC	27.25 13.38	INFORMIX CORP.	23.75	0.75	3.3
OTC	12.75 8.50	INTERACT CORP.	9.75	-0.25	-2.5
OTC	10.75 4.88	INTERLEAF INC.	7.25	-0.13	-1.7

## EXCH 52-WK RANGE

SEMICONDUCTORS

OTC	13.25 4.75	INTERPOLY INC.	12.63	0.38	3.1
OTC	18.75 7.75	KNOWLEDGEWARE INC.	12.75	0.38	3.0
OTC	42.25 15.50	LEISER CORP.	28.25	1.13	12.2
OTC	73.25 23.50	LOTUS DEVELOPMENT (H)	73.25	4.25	6.2
OTC	19.75 4.25	MATHSOFT	6.00	-0.13	-2.0
OTC	10.75 4.50	MCRAE ASSOCIATES	8.38	-0.13	-1.5
OTC	35.50 7.88	METRO GRAPHICS	13.50	0.63	4.9
OTC	37.50 13.13	MICRO FOCUS	14.13	-0.25	-1.7
OTC	11.63 4.38	MICROGRAPHICS	9.50	0.00	0.0
OTC	98.00 70.88	MICROSOFT CORP.	81.25	0.75	0.9
OTC	37.75 15.88	ORACLE CORP.	34.25	2.13	6.6
OTC	44.75 23.50	PARAMETRIX TECHNOLOGY	31.75	0.25	0.8
OTC	39.50 26.00	PEOPLESORT	32.50	2.88	9.7
OTC	5.88 3.50	PHOTONIC TECHNOLOGIES	5.75	-0.75	-12.7
OTC	48.00 22.00	POWERSOFT	18.63	1.13	5.9
OTC	39.75 10.25	PLATINUM SOFTWARE (I)	11.38	0.50	4.6
OTC	17.25 7.25	PLATINUM TECHNOLOGY	13.25	0.25	1.9
OTC	60.25 32.25	PROGRESS SOFTWARE CORP.	42.50	1.38	3.3
OTC	4.25 1.94	QUANTERDECK OFFICE SYS.	3.00	0.06	2.1
OTC	32.00 17.00	RAINBOW TECHNOLOGIES INC.	19.25	-0.75	-4.8
OTC	15.25 4.00	RASTEROPS	7.50	-0.38	-4.8
OTC	15.25 4.00	ROSS SYSTEMS	8.88	0.38	4.8
OTC	28.75 12.25	SAPINT INC. CORP. (N.Y.)	13.63	-0.75	-5.2
OTC	9.13 3.13	SAFETY SOFTWARE PRODUCTS	4.75	0.00	0.0
OTC	14.50 5.50	SOFTWARE PUBLISHING CORP.	8.63	0.13	1.5
OTC	17.25 6.75	SOFTWARE TOOLSWORKS INC.	9.63	0.13	1.3
OTC	2.88 1.19	SPINMAKER SOFTWARE	2.16	0.00	0.0
OTC	13.75 6.25	STATE OF THE ART	5.63	0.13	2.5
NYS	35.63 17.63	STERLING SOFTWARE INC.	34.00	1.63	5.0
OTC	21.63 12.00	STRUCT. DYNAMICS RESEARCH	15.38	0.63	4.2
OTC	24.25 11.50	SYBASE INC.	21.38	2.25	10.7
OTC	20.50 10.88	SYNTEC CORP.	18.88	1.25	9.2
OTC	52.75 25.75	SYNOPSIS	44.25	0.75	1.7
OTC	24.50 11.50	SYSTEM SOFTWARE ASSOC.	4.56	-0.56	-11.0
OTC	6.75 2.88	TRINICORP	30.00	2.75	10.1
OTC	30.00 13.00	VIEWLOGIC SYSTEMS	10.50	0.00	0.0
OTC	4.25 1.50	WALKER INTERACTIVE SYSTEMS	1.38	0.00	0.0
OTC	2.56 0.84	WORDSTAR	1.38	0.00	0.0



# Wysiwyg

## In the news

The following are the number of mentions specific industry companies received in the press, according to a sample of the Nexis/Lexis on-line data retrieval service between Jan. 1 and Dec. 1, 1993:

Intel	19,145
Apple	15,815
Hewlett-Packard	14,198
Microsoft	13,457
IBM	5,662

Source: The Delahaye Group, Inc.

## From our reader files

"I used to work at a company that had Paradyne equipment on three different floors of our building. Our terminal response on the third floor was really bad, so Paradyne was scheduled to come out and analyze the problem. I can't believe what the technician told me: that response time was slow because the data had to travel from the computer room on the first floor uphill to the third floor."

Hunt Waddell  
Senior systems analyst  
Systematics, Inc., Houston

## Great Names

Nancy Mirade
Vice president, operations
NetWorth, Inc.
Irving, Texas

Source: The Computer Museum, Boston

1) 104,565,76 (2) 2 To cool core memory (3) E-P type and N-type

Design by Jose E. Buzual

Was Ross Perot's presidential bid a glimpse of things to come? What team of computer industry people do you think should run for president and vice president, and why? Let us know what you think (preferably humorously). Contact Lory Dix at (800) 343-6474 x236 or CompuServe 76537,2413. If we use your idea, we'll send you a gift (but please leave a contact number).

## The 5th Wave by Rich Tennant



## Inside Lines

### HP gets Pentium fever

Hewlett-Packard is expected to announce today a dual Pentium processor version of the NetServer LM, with support for the Intel DX4 chip. Also, HP is expected to unveil next week a symmetrical multiprocessing (SMP) server addition to its NetServer family, according to sources close to the company. The server will have both Peripheral Component Interconnect and EISA expansion slots, and it will be offered in dual- and quad-processor models. The machine will support Intel's Pentium and DX4 microprocessors and support Microsoft's Windows NT, IBM's OS/2 SMP and SCO Unix operating systems.

### An Oracle for everyone

Plans are starting to jell at Oracle for "categorized" database offerings targeted at different client/server scenarios, an insider said last week. Oracle will introduce a line of Oracle 7 database offerings, with varying levels of technical support, targeted at specific numbers of users. A departmental server, for example, would handle up to 50 users and come with a toll-free telephone number for support. Products should start rolling out next quarter from Oracle via resellers, the source said.

### Offer good while supplies last

The Internet Engineering Task Force is hoping by its July meeting to finally come up with a new version of TCP/IP in an effort to resolve the address space and routing throughput problems that plague the present version. After more than two years of factional wrangling, the standards body has narrowed it down to two contestants: A protocol based on the OSI ConnectionLess Network Protocol and an enhanced TCP/IP specification dubbed Tuba. And there is good reason to hurry. With new users flooding the Internet, TCP/IP addresses are likely to quickly become scarce commodities.

### Laptop sports heavyweight price

IBM said it will announce a laptop version of its RS/6000 Unix workstation this week. The \$12,000 IBM RS/6000 Model N40, based on the PowerPC 601 RISC chip [CW, Feb 28], will ship on March 25. It is manufactured by Tadpole Technologies, Inc., which also makes the \$10,000 SPARCbook 3 for Sun users.

### Novell to get symmetric

Novell is racing to catch up to Microsoft in the SMP market, according to a reliable source. The source said Novell is working to put UnixWare on an eight-way SMP — Compaq's unannounced Compaq ProLiant 8000, which Microsoft has used for Windows NT development. Compaq will endorse the UnixWare port when it rolls out in April or May and will go after Sun's SPARCserver 1000 for large database and application server configurations.

### Little Blue

The IBM PC Co. is serious about the personal digital assistant (PDA) market and expects to ship at least one PDA before year's end. Officials said they will play in all PDA market segments and are working on a desktop extension machine that acts as a notebook/pen-based computer and a voice-oriented device with speech recognition and vertically-oriented tablets.

**Minicomputers to go:** IBM has decided to make the portable AS/400 available to end users. The company originally limited the single-user portable machine to software developers and other business partners that could use it to run on-site demos. The expanded marketing program is scheduled to be announced at the Common spring conference in Anaheim, Calif., later this month, along with a discount for Common members who have been pushing for a change. Don't pack away your news tips and story ideas: Spring them to News Editor Maryfran Johnson at (800) 343-6474 or fax them to her at (508) 875-8931. If E-mail is your thing, you can send MCI Mail to us at 590-8017, drop a line to 76537,2413 on CompuServe or send an Internet message to mjohnson@cw.com. Or try Computerworld's 24-hour tip line at (508) 820-3555.



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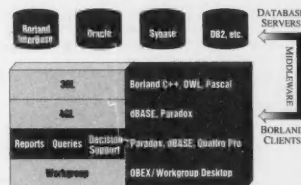


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